

2018 8th International Conference on Environment and Industrial Innovation (ICEII 2018)

April 27-29, 2018

Jin Jiang Inn (Lingang Xincheng), Shanghai, China
锦江之星酒店(新城店)



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Conference Venue

Jin Jiang Inn (Lingang Xincheng)

Address: 960 West Huanhu Er Road (Huanhu Xi Er Lu), Linggang Xincheng Dishui Lake and Lin'gang area Shanghai 201303 China

0.97km from Metro Station (Line 16): Dishui Lake

Transportation: Take the subway line 16 to DI SHUI HU, then take 1096 bus to West Lake Road No. 960.

锦江之星酒店(新城店)

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2018 HKCBEEES Shanghai Conference

Introductions

Welcome to HKCBEEES 2018 conference in Shanghai, China. The objective of the Shanghai conference is to provide a platform for researchers, engineers, academicians as well as industrial professionals from all over the world to present their research results and development activities in Environment and Industrial Innovation.

2018 8th International Conference on Environment and Industrial Innovation (ICEII 2018)

Papers will be published in one of the following conference or journals:



IOP Conference Series: Earth and Environmental Science (EES) (ISSN: 1755-1315), which is indexed by EI Compendex, Scopus, Thomson Reuters (WoS), INSPEC, et al;



Journal of Environmental Science and Development (IJESD, ISSN:2010-0264), which is indexed by the Engineering & Technology Digital Library, and indexed by WorldCat, Google Scholar, Cross ref, ProQuest , CABI, et al;



International Journal of Chemical Engineering and Applications (IJCEA, ISSN:2010-0221), and all papers will be indexed by Chemical Abstracts Services (CAS), Ulrich's Periodicals Directory, CABI, DOAJ, Electronic Journals Library, Google Scholar, Engineering & Technology Digital Library, ProQuest, and Crossref.

Conference website and email: <http://www.iceii.org/>; iceii@cbees.org

Presentation Instructions

Instructions for Oral Presentations

Devices Provided by the Conference Organizer:

Laptop Computer (MS Windows Operating System with MS PowerPoint and Adobe Acrobat Reader)

Digital Projectors and Screen

Laser Sticks

Materials Provided by the Presenters:

PowerPoint or PDF Files (Files should be copied to the Conference laptop at the beginning of each Session.)

Duration of each Presentation (Tentatively):

Keynote Speech: about **30** Minutes of Presentation and **5** Minutes of Question and Answer

Regular Oral Presentation: about **12** Minutes of Presentation and **3** Minutes of Question and Answer

Instructions for Poster Presentation

Materials Provided by the Conference Organizer:

The place to put poster

Materials Provided by the Presenters:

Home-made Posters

Maximum poster size is A1

Load Capacity: Holds up to 0.5 kg

Best Presentation Award

One Best Oral/Poster Presentation will be selected from each presentation session, and the Certificate for Best Oral/Poster Presentation will be awarded at the end of each session on April 28, 2018.

Dress code

Please wear formal clothes or national representative of clothing.

Keynote Speaker Introductions



Keynote Speaker I

Prof. CHOU Loke Ming

Tropical Marine Science Institute, National University of Singapore,
Singapore

Dr. CHOU Loke Ming is Adjunct Research Professor at the Tropical Marine Science Institute, National University of Singapore. He obtained his PhD in Zoology from the University of Singapore in 1976. His research on coral reef ecology and integrated coastal management covers Southeast Asia. His current research focus is reef restoration and he is particularly interested in how corals can be re-established in the highly turbid conditions of rapidly developing coastal areas. He is an Honorary Fellow of the Singapore Institute of Biology and a Fellow of the Singapore National Academy of Science.

Topic: “Biodiversity Enhancement of the Urbanized Coastal Environment”

Abstract—Urbanization pressure has resulted in extensive engineering modification of the coastal area, which is often accompanied by habitat degradation, biodiversity loss and compromised ecosystem services. The ecological impact of transforming a natural environment to a human-modified one is permanent but can be reduced if development plans take into account biodiversity enhancement. A coastal environment modified by engineering results in massive change of environmental features and biodiversity quality where biological community structure cannot return to levels supported by the original habitats. The physical change however can be looked upon as the formation of a new habitat, which can support biodiversity development suitable to it. Engineering plans can be developed to increase habitat opportunity for the development of richer and more variable biological communities. Coupled with further management interventions such as water quality management and ecological restoration, the urbanized coastal environment can function as a suitable habitat for coastal biodiversity. Biodiversity of marinas and active restoration of corals on seawalls in Singapore are discussed. An assessment of three marinas with good water quality and high artificial structural complexity showed that they can function as marine biodiversity refugia when designed with basic ecological considerations to enhance marine biodiversity. Separately, reef restoration projects indicated the possibility of colonizing seawalls with corals and other reef-associated species as well as improving degraded reefs and creating reef communities in new areas previously devoid of corals despite the heavy sediment load of urbanized coastal waters. Maintaining marine biodiversity in challenging environmental conditions resulting from urbanization can help to ensure continued provision of some level of ecosystem services, a situation that is more acceptable than drastic loss.



Keynote Speaker II

Prof. Gordon Huang

Faculty of Engineering and Applied Science, University of Regina, Canada

Dr. Gordon Huang is a Tier 1 Canada Research Chair in Energy and Environment, and Executive Director of the Institute for Energy, Environment and Sustainable Communities at the University of Regina, Canada. He holds BSc from Peking University (China), MSc from Simon Fraser University (Canada) and PhD from McMaster University (Canada). Since the 1990s, Huang has led over 150 research projects, produced over 800 peer-refereed international journal papers (with an SCI-based H-index of 51 in Science Citation Index under Thomson Reuters' Web of Science), and supervised over 100 Master/PhD students (with degrees awarded). Over 20 Huang's PhD graduates were appointed as faculty members at universities in Canada, USA, China and Singapore. He is a Fellow of the Canadian Academy of Engineering, and the President of the International Society for Environmental Information Sciences. He also acts as editor-in-chief for Journal of Environmental Informatics (<http://www.iseis.org/JEI/>), and served the United Nations Development Programme as Chief Scientist for a program of Rural Water Resources Management and Drinking Water Safety. His pioneering work in environmental risk management has been recognized as a significant innovation, and has influenced government and business approaches for tackling environmental challenges and formulating related policies.

Topic: "Factorial-Based Ecological Input-Output Model to Support Industrial Policy Formulation"

Abstract—Economic activities imply direct and indirect sources of environmental pollution. They are also highly heterogeneous contributors that have different emission performances in various industrial sectors. Given the fact that the potential for cost-effective pollution mitigation is still great, industry-related environmental policies are desired all over the world. Therefore, a factorial-based ecological input-output (FEIO) model is developed to facilitate comprehensive urban metabolism analysis, and to further support industry-related environmental policy making. Both positive and negative environmental factors are considered, such as water, wastewater, energy, forest, carbon emission, contaminant emission, and solid waste. In detail, FEIO incorporates ecological network analysis (ENA), input-output analysis (IOA), and factorial analysis within a general framework. The IO table is transformed and disaggregated based on energy consumption pattern and the underlying economic structure. Ecological relationships among various industries can thus be revealed, as well as effective pathways to mitigate negative environmental impacts from various industries. The driving and pulling force hierarchy is then identified to investigate the degree of dependence among all sectors. The system efficiency, redundancy, and robustness are estimated under different scenarios to diagnose the "health" condition of the urban metabolism system. In addition, factorial analysis is conducted to examine the impacts of main factors and their interaction. The developed model is applied to a case study of

Guangdong Province, China. The results provide a scientific basis for supporting the systematic diagnosis of urban GHG (greenhouse gas) metabolism and identifying economically efficient pathways to accomplish environmental targets.



Keynote Speaker III

Prof. Koh Hock Lye

Sunway University, Malaysia

H.L. Koh was born in Penang, Malaysia. He received his BSc from University of Malaya in 1970 and MA as well as PhD in mathematics in 1971 and 1976 respectively from University of Wisconsin, Madison, USA. He was the recipient of Oppenheim Prize of University of Malaysia and Fulbright Scholarship USA and DAAD Fellowship. He served as an Associate Member of the International Centre for Theoretical Physics (ICTP) from 1986 to 1992. He is currently a Professor at Sunway University Business School. He has served for 40 years in Universiti Sains Malaysia before continuing his research at Sunway University. His fields of specialization include environmental and ecological system modeling and simulations, integrated river basin management and modeling, numerical modeling of tsunami hazards and numerical simulation of dengue and H1N1 epidemics. Prof. Koh has many journal publications, notably in Water Sciences & Technology, Environmental Monitoring and Assessment, Water Quality Research Journal of Canada, Pollution in the Urban Environment, Journal of Asian Earth Sciences, Ecosystems, Ecological Modelling, Landscape Ecology and Agricultural and Forest Meteorology.

Topic: “The Life We Want: Achieving United Nation Sustainable Development Goals 2030”

Abstract—Concerned over the content, quality and purpose of education, the United Nations initiated the Decade of Education for Sustainable Development (DESD) 2005-2014. DESD challenges all forms of educational provisions to adopt concept, design, approaches and practices that foster the values of sustainable development (SD). DESD contributes to SD by promoting personal, societal, economic, cultural and political changes via specific cognitive, socio-emotional and behavioural outcomes that enable individuals to deal with the challenges of SD. Developed to succeed the UN Millennium Development Goals (MDGs, 2000–2015), the UN Sustainable Development Goals (SDGs, 2015-2030) was adopted in January 2016, as a template for sustainable development globally. The three principle dimensions (economic viability, social justice, environmental sustainability) are integrated with each other as they are interdependent and mutually reinforcing. Of the 17 SDGs, sustainable management of clean water and sanitation for all (SDG 6) is central to the attainment of virtually all other SDGs, particularly SDG 1 (No poverty), 2 (No hunger), 3 (Good health), 13 (climate action), 14 (life below water) and 15 (life on land). This keynote speech will focus on sustainable water resource management as a key to integrate and achieve many SDGs, covering diverse aquatic-terrestrial habitats including lakes, mangrove and wetland ecosystems. The important role of climate action and ecosystem service economic valuation in promoting and sustaining conservation and restoration of critical habitats will be discussed.



Keynote Speaker IV

Prof. Hu Yihuai

Shanghai Maritime University, China

Dr. Hu Yihuai received his Ph.D. of Marine Engineering from Wuhan University of Technology in 1993, and then worked in the Huazhong University of Science and Technology as a post-doctorial researcher until 1995. He immediately joined Shanghai Maritime University and has been working there since then. In 2006 he worked in the University of New South Wales in Australia as a visiting professor and he is now a professor in Shanghai Maritime University. He is also the member of Shanghai Society of Internal Combustion Engine, member of China Ship Building Society and member of Shanghai System Simulation Society, member of China New Energy Society. Over the past two decades, he has published 102 academic papers, guided 6 research projects and participated in 24 projects. His publications include "Accident Analysis and Safety Assessment of Marine Machinery System", "Marine Diesel Engine Propulsion System", "Marine Engine Room Simulation Technology", "Noise, Vibration and Emission Control of Marine Diesel Engine" and "New Energy and Ship Energy Saving Technology". He has obtained 11 awards and honors for teaching, research and technical development by Shanghai Education Committee and Communications Ministry of China. His current research interests include: Mechanical condition monitoring and fault diagnosis; Marine system simulation and engine room simulator; Renewable energy utilization on board ship.

Professor Hu Yihuai received his Ph.D. of Marine Engineering from Wuhan University of Technology in 1993, and then worked in the Huazhong University of Science and Technology as a post-doctorial researcher until 1995. He immediately joined Shanghai Maritime University and has been working there since then. In 2006 he worked in the University of New South Wales in Australia as a visiting professor and he is now a professor in Shanghai Maritime University. He is also the member of Shanghai Society of Internal Combustion Engine, member of China Ship Building Society and member of Shanghai System Simulation Society, member of China New Energy Society. Over the past two decades, he has published 110 academic papers and 6 books, guided 6 research projects and participated in 24 projects. He has obtained 11 awards and honors for teaching, research and technical development by Shanghai Education Committee and Communications Ministry of China.

His research interests include:

1. Mechanical condition monitoring and fault diagnosis;
2. Marine system simulation and engine room simulator;
3. Renewable energy utilization on board ship.

Topic: "Research into Sail-Assisting Technology for Ocean-Going Ships"

Abstract—With the price rising of petroleum oil and the consumption of fossil fuel as well as the concerning of environment pollution, sail-assisting propulsion plants has again become a

hot topic in shipping industry with the advantage of energy saving and environmental protection. This speech firstly introduces the research background of sail-assisting technology for ocean-going Ships. Wind energy resources on 9 typical global ocean shipping lines is analyzed according to the 2016 routing chart published by the United Kingdom Hydrographic Office, which discovers that the North Pacific Ocean line from Yokohama to Los Angeles, east sea line from Shanghai to Hong Kong and North Atlantic Ocean line from Bishop rock to Nouadhibou have rich wind energy resources and available for sail-assisted ships.

Sail type selection and experimental results of wing arc sail are then introduced. Thrust force coefficient, drifting force coefficient, lifting force coefficient, resistance coefficient and torque coefficient of the sail model are discussed and verified by wind tunnel tests. Optimal sail attack angle is calculated for the arc sail. Control mechanism and structure is designed for the operation the wing sail on board ship. Based on stability criteria regulations of ocean-going ship, this speech also proposes stability criteria requirements for sail-assisted ship and a calculation method of the ship stability parameters.

Another three types of sail structure are also suggested. The aerodynamic flow field around rotor sail, turbine sail and walker sail are calculated with CFD software, which reveals the Karman Vortex Street phenomenon. Pressure distribution and drag characteristics of rotor sail were analyzed. The influence of wind velocity, rotating speed, drum diameter and circumferential speed ratio to the lift coefficients and drag coefficients of rotor sail are studied, together with thrust coefficients and transverse coefficients under different speed. The aerodynamic characteristics of the turbine sail are described with RNG k- ϵ turbulence model and the lift coefficients and drag coefficients of simulated turbine sail are calculated under different rotation angles, suction intensity and separation plate position. The influences of structural parameters of both diversion airfoil and rear airfoil on the walker sails' aerodynamic characteristics are analyzed. These parameters includes diversion airfoil length, diversion airfoil deflective angle, rear airfoil chord length, rear airfoil thickness, rear airfoil effective angle and rear airfoil offset clearance. Wind tunnel experiments were carried out to verify the simulated aerodynamic characteristics of these sail models mentioned above, which has great significance to the application of the sails onboard ocean-going ships.

Schedule for Conference

Day 1

April 27, 2018 (Friday) 10:00~17:00

Venue: In the Lobby of Jin Jiang Inn (Lingang Xincheng) at the ground floor
Arrival Registration and Conference Materials Collection

Day 2

April 28, 2018 (Saturday) 08:50~18:15

Arrival Registration, Keynote Speech, and Conference Presentation

Venue: at the ground floor

Morning Conference

Venue: meeting room-1



Opening Remarks 8:50~9:00

Prof. Hu Yihuai, Shanghai Maritime University, China



Keynote Speech I 9:00~9:40

Topic: “Biodiversity Enhancement of the Urbanized Coastal Environment”
(Prof. CHOU Loke Ming, Tropical Marine Science Institute, National University of Singapore, Singapore)



Keynote Speech II 9:40~10:20

Topic: “Factorial-Based Ecological Input-Output Model to Support Industrial Policy Formulation”
(Prof. Gordon Huang, Faculty of Engineering and Applied Science, University of Regina, Canada)

Coffee Break and Group Photo Taking 10:20~10:40



Keynote Speech III 10:40~11:20

Topic: “The Life We Want: Achieving United Nation Sustainable Development Goals 2030”
(Prof. Koh Hock Lye, Sunway University, Malaysia)



Keynote Speech IV 11:20~12:00

Topic: “Research into Sail-Assisting Technology for Ocean-Going Ships”
(Prof. Hu Yihuai, Shanghai Maritime University, China)

Lunch 12:00~13:30 Venue: Jin Jiang Da Shu at the ground floor	
Afternoon Conference Venue: meeting room-1 and meeting room-2	
Session 1 13:30~15:30 Venue: meeting room-1 8 presentations-Topic: “Marine Energy Engineering and Ocean Observation” Session Chair: Assoc. Prof. Chih-Hua Chang	Session 2 13:30~15:45 Venue: meeting room-2 9 presentations-Topic: “Environmental Engineering and Ecological Management” Session Chair: Prof. Gordon Huang
Coffee Break 15:45~16:00	
Session 3 16:00~17:45 Venue: meeting room-1 7 presentations-Topic: “Wave Mechanics and Ship Machinery” Session Chair: Prof. Hu Yihuai	Session 4 16:00~17:45 Venue: meeting room-2 7 presentations-Topic: “Chemical Engineering and Industrial Innovation” Session Chair: Prof. Koh Hock Lye
Poster Session 17:45~18:15 Venue: meeting room-1 Session Chair: Prof. CHOU Loke Ming	
Dinner 18:20 Venue: Jin Jiang Da Shu at the ground floor	
Day 3	
April 29, 2018 (Sunday) Half Day Visit 9:00~12:00 Shanghai Maritime University	

- Note:** (1) The registration can also be done at any time during the conference.
(2) The organizer doesn't provide accommodation, and we suggest you make an early reservation.
(3) One Best Oral/Poster Presentation will be selected from each oral/Poster presentation session, and the Certificate for Best Oral/Poster Presentation will be awarded at the end of each session on April 28, 2018.

Session 1

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session. Please arrive at the conference room 10 minutes before the session begins to upload PPT into the laptop.

Afternoon, April 28, 2018 (Saturday)

Time: 13:30~15:30

Venue: meeting room-1

8 presentations-Topic: “Marine Energy Engineering and Ocean Observation”

Session Chair: Assoc. Prof. Chih-Hua Chang

O0004 (Session 1) Presentation 1 (13:30~13:45)

Bayesian-networks-based risk evaluation approach of offshore platform

Xiaobing Yuan, **Baoping Cai**, Xiaoyan Shao, Xiangdi Kong, Yonghong Liu and Guoming Chen

China University of Petroleum, Qingdao, Shandong, China

Abstract—This paper presents a Bayesian-networks-based risk evaluation approach of offshore oil platform, through the investigation of offshore oil platform is prone to accidents, to understand the structure of the relevant subsystems and collect the prior probability of related events. Then the events are divided into a three-tier structure, and the typical Bayesian network model of fire and collision accident in offshore oil platform is established. The corresponding parameter analysis is made to complete the verification and analysis of the model. The results show that the method based on Bayesian network can carry out effective risk analysis, and the risk assessment is feasible and advantageous by using this method.

O0049 (Session 1) Presentation 2 (13:45~14:00)

Flow drag reduction and thermal insulation in subsea pipelines

Xili Duan

Memorial University of Newfoundland, St.John’s, NL, Canada

Abstract—In offshore oil and gas production, the harsh subsea environment with high pressure and cold sea water leads to high risk of hydrate formation and wax deposition that can cause plugging in the flow system. Additionally, flowing of the highly viscous fluids through long distance pipelines causes significant energy loss due to flow friction/drag. Subsea oil transportation often requires large energy input once the natural pressure of the reservoir is depleted. However, power supply to these flow systems is often limited, resulting in challenges to transport the product in an efficient manner. This talk presents recent research

progress in our group to address these challenges with a thermal hydraulic approach. Technologies are being developed to reduce heat loss and flow drag in subsea flow systems and thereby promote flow assurance and energy conservation. A novel hybrid insulation that enables thermal energy storage is developed to significantly increase the cool down time after operation shutdown. Flow drag reduction is achieved by adding low concentration chemical additives in the fluids. Analytical and numerical models are developed to predict heat loss and drag reduction performance. A flow loop is also built to experimentally investigate flow drag reduction and thermal insulation. The results demonstrate up to 30% drag reduction by adding < 20 ppm polymer in the flow, and twice longer cool down time of a pipeline with the new hybrid thermal insulation.

O0040 (Session 1) Presentation 3 (14:00~14:15)

Study on the influence of small attitude angle on lidar wind measurement results

Peilin Dou, **Xin Zhang**, Xiaochen Han, Yangyang Xue

Jiangsu University of Science and Technology, Zhejiang, China

Abstract—When carrying on wind profile measurement of offshore wind farm by Floating Doppler lidar technique, the platform often produces motion response under the action of ocean environment load. The motion response affects the accuracy of lidar wind measurement. In this paper, the synchronous observer experiment is designed to study the influence of small attitude angle on the accuracy of laser radar's wind measurement, giving an example of comparing the wind measurement data of two lidars, and carrying out the linear regression statistical analysis for all the experimental correlation data. It is found through experiments that the small attitude angle has less influence on horizontal wind speed and wind direction, and has a greater impact on vertical wind speed.

O0009 (Session 1) Presentation 4 (14:15~14:30)

Analysis and optimization on the flow ability of wave buoy based on AQWA

Jinpeng Hu, Ling Zhu and Shihui Liu

South China University of Technology, Guangzhou, Guangdong, China

Abstract—Wave buoy is a modern ocean observation facility, and the ability of following wave is an important parameter to reflect the measurement accuracy. This article will focus on the study of hydrodynamics on the ability of three common appearance buoys. By using the hydrodynamic calculation software AQWA, this article will study the heaving response of free buoy in regular wave under frequency domain, it combined with the typical Green function method for solving the wave force and the related hydrodynamic coefficients of floating structure, and it applied the three dimensional potential flow theory and based on the single degree of freedom motion equation. According to the features of short period wave in Chinese sea states, this paper will calculate the heaving response RAOs of 25 buoys on different shapes, weight and shape parameters. Hydrodynamics calculation results show that: under the same conditions in the environment load, the flow-ability of ball float 3-2 has better performance than other buoys in working condition. The research methods of this article has provide good scientific basis for the parameter design on ocean data buoy.

O0030 (Session 1) Presentation 5 (14:30~14:45)

A capable smart sensor interface module for interoperable ocean observatories

Shijun Lin and Feng Lyu

Tongji University, Shanghai, China

Abstract—The rapid development of ocean observatories results in a great challenge to integrate so many sensors into one system. Some solutions have been proposed to address this issue, such as MBARI PUCK, IEEE 1451 and OGC SWE. This paper proposes a novel smart sensor interface module solution which is more capable than PUCK. As the interface standardization is achieved at the instrument-side in our solution, the design of ocean observatory systems is simplified. What's more, the feature of distributed intelligence of the module can benefit many in-situ applications of ocean observatories.

O0031 (Session 1) Presentation 6 (14:45~15:00)

Switching high voltage DC power in branching units of large-scale cabled seafloor observatories

Shaoduo Zheng and Feng Lyu

Tongji University, Shanghai, China

Abstract—Cabled Seafloor Observatories(CSOs) are powered by shore stations with DC voltage levels up to -10kV. When a backbone or spur cable fault occurs, the power system must isolate the fault by disconnecting the faulty segment quickly. So the BUs installed in the backbone cable need to carry out the switching operation under high voltages(HV). However, DC circuits have no zero-current points and the fault currents will rise rapidly, bringing a big challenge to the switching on/off operation. In this paper, we have purposed an HVDC circuit breaker based on series-connected IGBTs with voltage balance. Under the backbone voltage of -10kV and a peak current of around 14A, the simulation results show that the proposed design is feasible, with the switching-off time about 1ms.

O0017 (Session 1) Presentation 7 (15:00~15:15)

Impacts of coastal development on the shoreline change of the eastern gulf of Thailand

Butsawan Bidorn and C Rukvichai

Chulalongkorn University, Bangkok, Thailand

Abstract—The Map Ta Phut (MTP) Port has been developed on the middle portion of the Rayong Bay, Thailand, since 1992. After the expansion of the port completed in 2002, the port has an approximately 3.5 km wide and extending 4.0 km seaward. This paper provides the assessment of the construction of the MTP Port project on the shoreline of the Rayong Bay. Historical shoreline positions were extracted from aerial photography and satellite imagery taken between 1957 and 2016 using ArcGIS version 10.4. The rates of shoreline changes pre- and post-port development were implemented using the Digital Shoreline Analysis System (DSAS). Results indicate that the Rayong Bay shoreline mostly was in dynamic equilibrium with an average rate of less than 0.5 m/y prior the construction of the MTP port. After the completion of the port, a significant shoreline accretion has continuously been found along

the shoreline of about 500 m adjacent to both sides of the port. Meanwhile, the Rayong Bay shoreline had been eroded about 28 % of the total shoreline after the port completed in 1992 and increased to 30% after the port expansion in 2002. Coastal protection structures included seawalls, segment breakwater, Y-shaped groins, and jetty were applied along the receded shore. Most of those structures have successfully stabilized the shoreline, and the Rayong Bay has likely reached a new dynamic equilibrium since 2011.

O0052 (Session 1) Presentation 8 (15:15~15:30)

A Method for Estimating the Distance of Near-Ocean-Bottom Sources by Combining VLF Underwater Acoustic Field and Scholte Wave Field

Han Zhao, Guiqing Sun, Hanhao Zhu, Junxin Yuan
Zhejiang University, Zhoushan, Zhejiang, China

Abstract—In order to solve the problems of passive detection of very-low-frequency (VLF) underwater sound sources, this paper proposes a method of estimating sound source distance based on combining underwater sound field and Scholte wave field. VLF sources near the ocean bottom generate the sound field in the water, then seismic waves are excited by the of near-field effect. The surface wave propagating along the ocean bottom interface is the Scholte wave. By deploying a hydroacoustic&seismic-wave joint detection system on the ocean bottom, the acoustic field and the Scholte wave field excited by the source can be collected. Due to the different physical properties of water acoustics and Scholte waves, the Scholte waves can be distinguished by analysing the polarization characteristics of the captured signals. Due to the different velocity between the underwater acoustics and Scholte waves, the propagation delays to the joint detection system are also different, and the delay difference can be obtained by the correlation method. Combined with the surrounding parameters, the distance of the target source can be determined. Theoretical analysis and finite element simulation experiments show that this method can estimate the position information of near-ocean-bottom VLF underwater sources in the ideal case.

Session 2

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session. Please arrive at the conference room 10 minutes before the session begins to upload PPT into the laptop.

Afternoon, April 28, 2018 (Saturday)

Time: 13:30~15:45

Venue: meeting room-2

9 presentations-Topic: “Environmental Engineering and Ecological Management”

Session Chair: Prof. Gordon Huang

O0029 (Session 2) Presentation 1 (13:30~13:45)

The effect of increased Temperature and coral acclimation of *Sinularia dura*

Z S Juhi and **K A Rabbani**

Independent University, Bangladesh

Abstract—Coral reefs are one of the most vulnerable ecosystems in the world. With evidence of recent and notable mass coral bleaching at the Great Barrier Reef, it is imperative that coral species and their response to increased temperatures be studied in order to identify coral acclimation and the “winners” and “losers” of climate change. *Sinularia dura* is a common coral species in South Asian and Southeast Asian water. This study has shown that even a 1 to 2 degrees centigrade increase in temperature can have huge effect on the health of *Sinularia Dura* which has implications to the status of coral reefs due to increased sea temperatures caused by climate change.

Z3001 (Session 2) Presentation 2 (13:45~14:00)

Regime Shift Analysis and Numerical Simulation for Effective Ecosystem Management

Hock Lye Koh, Wai Kiat Tan, and **Su Yeann The**

Universiti Sains Malaysia, Malaysia

Abstract—Ecosystems are constantly subject to shifts among multiple locally stable and unstable states. Such regime shifts or bifurcations are fascinating ecological phenomena, involving multiple causes and many variables that change at different spatial-temporal scales, potentially altering the direction of feedbacks. They are crucial for effective ecosystem management because regime shifts may impair valuable ecosystem services provided by nature and because recovery of desired states may be difficult and costly. Lakes may undergo regime shifts between two alternative steady states, oligotrophic or eutrophic, due to the strong interaction between exogenous phosphorus (P) input and endogenous interaction between water and sediment P. Many lakes exhibit either a desirable oligotrophic clear-water state with abundant macrophytes and low chlorophyll concentrations, or an undesirable eutrophic turbid condition with high chlorophyll concentrations and sparse macrophytes. A regime shift from a clear-water oligotrophic state to a turbid eutrophic condition may occur in response to a combination of increased exogenous nutrient loading and a strong feedback involving P release from the sediments. This paper presents water and sediment quality data for a small shallow stagnant lake in Selangor Malaysia indicating progressive deterioration of water quality arising from intensification of eutrophication due to accumulated nutrient loading from a relatively large human settlement over three decades. It then provides numerical simulations and analytical synthesis for explaining and predicting the prognosis of lake eutrophication regime shifts. The paper concludes with a practical and sustainable remediation measure for rehabilitating lake eutrophication.

O2003 (Session 2) Presentation 3 (14:00~14:15)

Fabrication of superhydrophobic-superoleophilic cement-coated meshes and their applications for oil/water separation

Shude Li, Sun Jing, Jinlong Song and **Ziai Liu**

Dalian University of Technology, Dalian, Liaoning, China

Abstract—Extreme wettability materials have shown great ability in dealing with oily industrial wastewater emission and oil spill accidents. Whenas, most of the addressed materials are technically sophisticated or inclined to involve corrosive or toxic chemicals. Herein, we fabricated an easy fabricated, low cost and robust material for oil/water separation. The superhydrophobic-superoleophilic (SOO) cement-coated meshes were made simply by dipping copper mesh in cement paste and surface modification. The micro/nanostructure and low surface energy endowed the mesh with great superhydrophobicity and superoleophilicity in air. The mesh had great oil absorption ability and high separation efficiencies for various oils. They were also admirably recyclable and durable. The meshes could be used to separate oil/water mixture at least for 20 cycles with high separation efficiency, and showed respectable superhydrobocity after being bent for 30 times. This simply fabricated, low cost and robust material will have great potential to be used in industrial wastewater treatment and oil spill in seawater.

Z2001 (Session 2) Presentation 4 (14:15~14:30)

Chitosan-silica-polyethylene Glycol Composite Membrane for Adsorption of Dye and Bivalent Metal Ions from Textile Waste Water

F. Widhi Mahatmanti, W. D. P. Rengga, E. Kusumastuti, Nuryono

Department of Chemistry, Faculty of Mathematics and Natural Sciences, Universitas Negeri Semarang, Indonesia

Abstract—The use of membrane on separation has been widely studied. In this study, the Chitosan-silica-polyethylene glycol (Ch/Si/P) composite membrane is prepared and performed adsorption test for bivalent metal ions, including Pb(II), Cu(II), and Cd(II), and Rhodamine B dye in textile waste water. The Ch/Si/P composite membrane is made by mixing of chitosan, silica and polyethylene glycol with ratio 1: 0.8: 0.5 (w/w). The performance of membrane is carried out using Sentino pump device. The result shows that membrane has a heteregenous and very tight structure. On the other hand, commercial membrane shows a fibrous structure. The rejection test shows that permeation of Pb(II) > Cd(II) > Rhodamine B > Cu(II). In advanced, the selectivity of Ch/Si/P composite membrane increases from Cu(II) > Rhodamine B > Pb(II) > Cd(II). In comparison, the commercial membrane shows the selectivity in the sequence of Rhodamine B > Cd(II) > Pb(II) > Cu(II). Further, the adsorption study indicates that adsorption capacity of Cu(II) is higher than Pb(II), followed by Cd(II) and Rhodamine B. It is clearly observed that Ch/Si/P composite membrane for bimetal ions is better than commercially available, and it indicates that functional group spread on the surface acts as a binding site.

Z0018 (Session 2) Presentation 5 (14:30~14:45)

Isolation of Pectin from carrot peel as biosorbent of Pb(II) ion

Budi Hastuti, Saptono Hadi, and Fian Totiana

Department of Chemistry Education, Faculty of Teacher Training and Education, Universitas Sebelas Maret, Indonesia

Abstract—Pectin is a natural polysaccharide that is widely used. Pectin can be used as a potential bioadsorbent to bind heavy metals. The aims of this study are to know whether pectin can be isolated from carrot peel as evidenced using FTIR spectrometry, to know the optimum condition of pectin in adsorption of Pb(II) ion. The parameter of optimization of adsorption methods are pH variation, mass adsorbent and long adsorption time. Pectin is isolated from carrot peel by extraction method. Analysis of content Pb(II) ion using AAS instrument. The results of the research have shown that Pectin can be isolated from carrot peel evidenced by FT-IR spectroscopy. The optimum condition of carrot pectin to adsorb Pb(II) occurs on pH solution 6, Pb(II) absorbed 44.00% with adsorption capacity 6.00 mg/g. The optimum mass adsorbent to adsorb Pb(II) is 15 mg, Pb(II) absorbed 46.01% with adsorption capacity 6.13 mg/g, whereas the optimum contact time is 120 minutes, Pb(II) absorbed 38.00% with adsorption capacity 4.80 mg/g.

Z0016 (Session 2) Presentation 6 (14:45~15:00)

Microbial protein enrichment and treatment of winery residue from fungi and yeast by syntrophic fermentation

Rui Gao, Qiuying He, Yuanyuan Chen, Yuting Duan, Li Xie

Key Laboratory of Yangtze River Water Environment, Institute of Biofilm Technology, College of Environmental Science and Engineering, Tongji University, China

Abstract—Yellow wine lees and rice wastewater are seasonally discharged with high amount of organics. The potential of cultivating *Candida utilis* and *Geotrichum candidum* to produce value-added single cell protein (SCP) and simultaneously bio-transform the wastes was investigated. A series of batch experiments were conducted under sterile condition. Co-culture matrix of *Candida utilis* and *Geotrichum candidum* resulted in the highest biomass and crude protein yield of 4.2g increased biomass/initial biomass and 68.4%, respectively. Response surface analysis was applied to optimize the fermentation process. The optimal conditions for SCP production with 66.3% of crude protein content were fermentation time of 4 days, solid-to-liquid ratio of 6% (w/v), inoculation proportion of 1:1 (ratio of co-cultures (v/v)), inoculum dose of 18% (v/v), and aeration rate of 1.4 volume of air/volume of reactor per minute. The soluble chemical oxygen demand (SCOD) and the total nitrogen removal efficiency were 78% and 55% respectively. Acetic acid was the main species contributing to the residual SCOD. Furthermore, the contents of essential amino acids closely matched commercial standard for fishmeal and soybean meal, providing high possibility of animal food application.

Z0019 (Session 2) Presentation 7 (15:00~15:15)

Utilization of shrimp shell waste as matrix controller by using ionotropic gelation method in slow release fertilizer based on environmental conservation

Wara Dyah Pita Rengga, **Muhammad Afnan Mubarak**, N S Cahyarini

Chemical Engineering Department, Faculty of Engineering, Universitas Negeri Semarang, Campus Sekaran Gunungpati Semarang, Indonesia

Abstract—The Availability of shrimp waste in Indonesia is huge, especially in shrimp pond areas. However, it has not been utilized optimally and caused environmental pollution. The

weight of shrimp waste reaches 30%-40% of its weight. Most of the shrimp waste is dominated with shrimp shells. Shrimp shells containing 60% -70% chitin. It will produce 15-20% yield of chitosan synthesized from chitin. On the other hand, the use of fertilizer continues to increase. Fertilizer is an essential nutrient for plants if lack nutrients to make plants can't grow normally. Preparation of chitosan as matrix controller begins from shrimp shell synthesis which is obtained by deacetylation method with the highest deacetylation degree of 74.5% and the optimum deacetylation is 71.2%. The SEM test which shows the thickening and rougher structure of the fertilizer surface, fertilizer coated by macrospheres has a thickener and coarser surface so as to inhibit the release of elements inside. The shrimp shell waste based coating is able to inhibit the release of NPK contained in the fertilizer. The occurrence of ionic crosslinking shown by the presence of N-H groups and -P=O on material.

O0027 (Session 2) Presentation 8 (15:15~15:30)

Yanliao Beach Nourishment Methods

Hsing-Yu Wang, Hui-Ming Fang and Yun-Chih Chiang

National Taiwan Ocean University, Keelung, Taiwan

Abstract—Yanliao Beach, part of Taiwan's Northeast Coast National Scenic Area, is a major sightseeing and recreation spot. In recent years, the number of tourists has increased, and maintaining the beach's recreation function has become crucial. In 2007, Typhoon Krosa caused substantial beach erosion at Yanliao Beach; sand dunes collapsed, resulting in a beach scarp and endangering facilities toward the back of the beach. To protect the sand dunes and beach scarp of the post-typhoon topography, based on long-term Yanliao Beach topographic survey information and long-term tidal water level records, this study conducted an integrated artificial beach nourishment method that comprised replenishing the coastal beach and dunes. The planned areas for sand replenishment were those above the mean high water line. This beach nourishment measure protected the dunes from collapsing further and mitigated the risk of beach nourishment polluting the water in front of the beach. Topographic survey results revealed that the large amount of sand deposited in the intertidal zone resulted in the 0 m shoreline advancing toward the seaside. The width of the beach increased, indicating the success of this integrated beach nourishment method.

Z0029 (Session 2) Presentation 9 (15:30~15:45)

Aquifer / Water Sources Drip Factor as Alternative to Measure Climatic Effects on Availability of Water Agricultural Irrigation in Semiarid / Arid Zones

Norzagaray-Campos Mariano, **Llanes-Cárdenas Omar**, Muñoz-Sevilla Patricia, Ruiz-Guerrero Rosario, Ladrón de Guevara-Torres María and Armenta-Cabrera José
Instituto Politécnico Nacional-CIIDIR-Sinaloa, Mexico

Abstract—On semi-arid/arid regions (SA/A), new climatic conditions transformed irrigation water on scarce and to obtain efficiency on its use (Eu) is necessary its dosage (D). Under Crops quality and the aim to avoid losses by drainage, evaporation and runoff is necessary implement alternatives front to risks and encountered mechanisms for counteract H₂O_i lack and promote Eu and D. Any aquifer to plan, requires immediately know the volumetric exchange ($\Delta V(x,y,t)$) between regional aquifer and sources hydric. Therefore, the objective

was determine the spatial variation of drip factor (Fg) between aquifer/water tributaries and take it as indicator of $\Delta V(x,y,t)$ behaviour in SA/A coastal agricultural valley of Northwest of Mexico known as " Heart Agricultural of Mexico". Fg results respond at linear expression $y = 26.70 x - 44.15$, an annual range average of 413-1813 m/year governed by porous media and recharge dynamics closely linked to transitivity anisotropy low to medium ($R \approx -0.6$) and included on range 20-70 m²/day. In few occasions the river and streams yield water to aquifer (rainy seasons), and on dry season; only the aquifer gives large amounts to all region tributaries. The low sensitivity response at dripping and climatic presence changes constitutes a high risk for H₂O_i and sustainable agriculture due to continuous downward trend of watertable levels that encourage an overexploitation responding at lack water and the occurrence of big agricultural economic losses caused by the last intense droughts continually confronted this region. Knowing $\Delta V(x,y,t)$ balance helps at control water losses, at sustainable agriculture and contributes to achieving goals of Eu and D; adapted to new agricultural uses forced by climate change.

Session 3

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session. Please arrive at the conference room 10 minutes before the session begins to upload PPT into the laptop.

Afternoon, April 28, 2018 (Saturday)

Time: 16:00~17:45

Venue: meeting room-1

7 presentations-Topic: "Wave Mechanics and Ship Machinery"

Session Chair: Prof. Hu Yihuai

O0010 (Session 3) Presentation 1 (16:00~16:15)

The experimental study on the hollow wave dissipation structure of a semi-submersible embedded ball box in the specification spectrum wave

Danian Liu, Zichang Shangguan, Zhiyun Wang

Dalian Ocean University, Dalian, Liaoning, China

Abstract—In order to break wave to protect coast without coastal landscape destruction, for better coastal protection and development. Based on the physical experiment mode, a kind of semi-submersible embedded spherical block wave structure is proposed. In this paper, we discussed the effect of this wave dissipation structure. The experimental results show that the wave structure has a good wave dissipation effect. At the same time, the specially designed ball box net box can be used as the incubator to bring economic benefits.

O0013 (Session 3) Presentation 2 (16:15~16:30)

Numerical simulation of a solitary wave impinging on a vertical wall with a step at its bottom

Chih-Hua Chang, Yuan-Bin Zhen

Ling-Tung University, Taichung, Taiwan

Abstract—For the convenience and safety of residents along the coast, steps have been built at various places along the coast where the land meets the sea. Over time, these steps are damaged by the impact of waves. A huge wave can travel beyond these steps, thus destroying coastal facilities and threatening human safety. Many researchers have studied the nature of solitary waves that are reflected by a vertical wall. Previous studies have focused on the maximum run-up height of solitary waves, the duration time taken to rise and hit the wall, and the lag phase after reflection. We use the findings of these studies as a basic validation for the results of this study in which we modeled a tsunami-like, solitary wave that hits a cliff with a step at its bottom. We mainly focus on the change in wave height and vortex motion of a solitary wave that rises above a step and then hits the upright wall. We apply a stream function–vorticity formulation that is solved by the finite-analytic method with a transient curvilinear coordinate grid that evolves with a fully nonlinear free surface to simulate the wave-structure interaction process.

O0016 (Session 3) Presentation 3 (16:30~16:45)

Laboratory study of the spatial distribution of extreme overtopping events at vertical structures

Shudi Dong, J M Pearson

University of Warwick, Coventry, The United Kingdom

Abstract—Two-dimensional physical model experiments were conducted on a plain vertical seawall with a 1:20 sloping foreshore. Based on previous research, exponential equations were improved to describe spatial measurements for both impulsive and non-impulsive conditions. Comparisons were made between the spatial distributions from previous research studies, and compared to results of this study. It was observed that overtopping water generally distributes closer to seawall than previous predictions. 90% of overtopping was found generally to land within the distance of 0.04 wave-length under impulsive conditions, and similar results were observed in non-impulsive cases. A comparison between the spatial distribution of extreme events and total overtopping volume are discussed. Exponential equations are improved for fitting the distribution of extreme overtopping waves.

O0026 (Session 3) Presentation 4 (16:45~17:00)

A preliminary study on numerical waves and its impact on horizontal plate based on fluent

Jinpeng Hu, Shihui Liu and Ling Zhu

South China University of Technology, Guangzhou, Guangdong, China

Abstract—Based on the N-S equations for viscous, incompressible fluid and RNG turbulence model, a two dimensional Numerical Wave Tank is established, utilizing the secondary development function of Fluent software and the VOF method. A two-dimensional

linear regular wave and a random wave are generated by defining the motion of moving boundary and adding wave absorbing zone at the end of the wave tank. The resulting numerical wave shape agreed well with the theoretical shape. The simulated wave spectrum of random wave keeps the original structure of the target spectrum. The impact of waves on the horizontal plate is simulated referring to the existing physical model test. Compared with the physical and the numerical pressure data of 11 pressure points under the horizontal plate, it is found that the two datas fit well, indicating the effectiveness of Fluent in simulating the interaction between waves and structures, which lays a foundation for further exploring the factors that affect the magnitude of the impact pressure on the horizontal plate.

O0044 (Session 3) Presentation 5 (17:00~17:15)

Research of statistical characteristics of target strength of a single-layer cylindrical shell with random coating

Hu Bo

China Ship Developing and Designing Center, Hubei, China

Abstract—That anechoic tiles fall off from the surfaces is a common phenomenon that modern submarines are frequently faced with, which has negative effects on acoustic stealthy performance and increase Target Strength(TS) levels. Based on Monte-Carlo theory, PEM calculations are made by assuming that each anechoic tile fall off randomly and their conditions are tested separately. And the statistical-based values where statistical probability density of the PEM results reaches its culmination are considered as the TS level of a structure that part of its anechoic tiles fall off. The effectiveness of the MC-PEM is validated by the calculation of plate with anechoic tiles, since it achieves good agreement with the results of analytical method. And the relations between TS and the anechoic tiles' exfoliation rate of single-layer cylinder shell are gained by MC-PEM. Finally, log-normal distribution is introduced to describe cumulative failure probability of anechoic tiles. And the dynamic characteristic of TS versus non-dimensional time suggests that it is of significance to overhaul anechoic tiles in the region of $0.3t \sim 0.5t$ (t represents average lifespan of anechoic tiles) as to keep TS in relative low level.

O2002 (Session 3) Presentation 6 (17:15~17:30)

A HAZID Study on Fuel Gas Supply System in Small LNG Fuelled Fishing Vessel

Yoon-Hyeok Lee, Yude Shao and Ho-Keun Kan

Korea maritime and ocean university, Busan, South Korea

Abstract—With upcoming strict emission limits for shipping industry, interest in clean technology to meet this challenge has increased recently. And the fishing vessels for alternative for the ship design are stepping up in intensity. It is considered that there exist several options to reduce SO_x, NO_x, CO₂ and PM emissions from small shipping or fishing such as use of low-Sulphur/low-Nitrogen diesel fuel which are more expensive than traditional residual fuel oil, use of exhaust gas treatment systems, and the use of alternative fuels like natural gas. One of alternatives to the recent pressure regarding the environmental protection, natural gas as fuel is drawing attention from many parties in its utilization for large and small ships. The use of natural gas as fuel could offer an interesting solution in fishing

industry to reduce exhaust gas emissions in air in terms of NO_x, SO_x and CO₂ as well as of PM emissions compared to fuel oils, allied in parallel to its potential economic benefits.

In the context mentioned above, we have developed a concept design for small LNG fuelled fishing vessel. And within a research project between Korea Ship Safety Technology Authority (KST) and Hong-ik university, further development and design improvement were being undertaken. As one of key processes during the novel system development, a Hazard Identification (HAZID) study was carried out by a multi-disciplinary HAZID team on 8th November, 2017, at KMOU, Korea. The HAZID study was conducted to increase the knowledge of the proposed concept and to identify the major issues or hazards that could have a major impact on the safety of the vessel. As a result of the HAZID study, 45 hazards in total were explored and ranked in terms of risk index for the semi-quantitative risk evaluation. Among the hazards identified, one hazard (1) was found to have unacceptable risk level (high level) and nineteen (19) to have acceptable but ALARP risk level (medium level).

O2001 (Session 3) Presentation 7 (17:30~17:45)

Dynamic optimization on bunkering time limit of gas fueled ship during Ship-to-Ship LNG bunkering process

Yude Shao, Yoon-Hyeok Lee and Ho-Keun Kang

Korea maritime and ocean university, Busan, South Korea

Abstract—Using natural gas as fuel of ship is considered as a realistic and feasible solution in order to comply with the stringent emissions of IMO's regulation. For the liquefied natural gas, the LNG bunkering process for LNG fueled ship would be different from HFO bunkering, as the cryogenic liquid transfer could generate considerable amount of boil-off gas (BOG). Here, the Aspen HYSYS is used to investigate and analyze the dynamic simulation on total BOG generation between the cargo tank of bunking ship and fuel tank of receiving ship during LNG bunkering process. For the modeling of the study, the diameter of bunkering line is set to 8 inch, while the BOG return pipeline is set at 4 inch to satisfied the pressure of receiving ship and BOG generation. The capacities of cargo tank and fuel tank for bunkering and receiving ships are set at 4,500 m³ and 700 m³, respectively. In this study, to analyze the BOG variation according to the bunkering time, different time limits are set to several cases.

The results showed as follows: (1) The BOG flowrate is inverse proportional to the bunkering time limit. (2) The BOG generation mass reached peak point when the bunkering time limit at 120 minutes, then reduced gradually. (3) Moreover, the pressure difference between bunkering and receiving ship reduced, i.e., become closer with the extension of the bunkering time limit. When the filling rate of receiving ship reaches at 85%, the pressure rate in bunkering ship is increasing due to decreasing of LNG flowrate.

Session 4

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session. Please arrive at the conference room 10 minutes before the session begins to upload PPT into the laptop.

Afternoon, April 28, 2018 (Saturday)

Time: 16:00~17:45

Venue: meeting room-2

7 presentations-Topic: “Chemical Engineering and Industrial Innovation”

Session Chair: Prof. Koh Hock Lye

Z2002 (Session 4) Presentation 1 (16:00~16:15)

Esterification of α -Pinene from turpentine oil using Natural Zeolite catalyst

Nanik Wijayati, Supartono and E. Kusumastuti

Department of Chemistry, Semarang State University, Indonesia

Abstract—Turpentine is one of the oils obtained from pine trees with >80% α -pinene composition. Turpentine oil has a high selling value by making a pinene derivative through an esterification reaction. The esterification reaction was carried out with time variation (2, 3, 4 hours) and reaction temperature (30, 40, 60 °C) using natural zeolite. Characterization of the catalyst using X-Ray Diffraction, IR spectroscopy and Scanning Electron Microscopy. The esterification reaction product was analyzed by IR spectroscopy, and gas chromatography - mass spectroscopy. The main product of α -pinene esterification reaction is terpinyl acetate (21.40%), and the selectivity of 28.87 %, produced at 40 °C for 3 hours.

Z0042 (Session 4) Presentation 2 (16:15~16:30)

Rice husk extracts ability to reduce the corrosion rate of mild steel

Marta Pramudita, M.G.Utomo, Sukirno, M Nasikin

Department of Chemical Engineering, Universitas Indonesia, Indonesia

Abstract—Rice husk extracts ability to reduce the corrosion rate of mild steel in 1 M H₂SO₄ solution was studied using weight loss technique. XRD analyzed silica structure of rice husk extracts. The Inhibitor was added in various concentrations (0,10,15,20 and 25 ppm) at different immersion times (2, 4, 6 and 8 h). The results obtained indicate that rice husk extract acts as a good inhibitor for mild steel. Rice husk extract was able to reduce corrosion rate up to 4.77 mmpy with inhibition efficiency exceeded 90 in 1 M H₂SO₄ solution. X-ray Diffraction (XRD) analysis shows the silica structure present in rice husk extracts is amorphous, thus makes it more environmentally friendly.

Z0026 (Session 4) Presentation 3 (16:30~16:45)

Developing a Portable Hydroelectric Generator Using Axiomatic Design Method

Hartomo Soewardi and E A Putra

Department of Industrial Engineering, Faculty of Industrial Technology, Islamic University of Indonesia, Indonesia

Abstract—Hydroelectric power plant is the largest renewable energy source in Indonesia. There are several models of hydroelectric power machine applied in Indonesia, one of them is a portable generator. However, there are still some problems in the existing portable design, for example it has a big size and unattractive design; it is unpractical and unsafe to use, that it results in ineffective and inefficient use of the generator as well as results endanger. This reality occurs because the design does not meet user criteria. The purpose of this study was to redesign the portable hydroelectric power generator which can satisfy user requirements. Survey was conducted to identify the customer needs and axiomatic design method was used to determine the design parameter by mapping process from customer attribute and functional requirement. Statistical analysis was conducted to test the hypothesis. The results of this study showed that the proposed design of portable generator can increase user satisfaction as much as 73.67% so it is recognized to be different from the existing design. The design developed is also valid to satisfy user requirement at 5% significance level including the fact that it is durable, waterproof, attractive, lightweight, small in size, and portable.

Z0027 (Session 4) Presentation 4 (16:45~17:00)

Ergonomic Design of Electric Car Cockpit

H. Soewardi and **Julin Arum Asih Nur Sarinindiyanti**

Islamic University of Indonesia, Indonesia

Abstract—Comfortable cockpit is an important component in a car specially provided for driver while driving. This facility may provide space for freely move to maneuver and control the car. However many drivers complain about some problems on part of the body such as neck, upper and lower back, waist, buttock, thighs, and knees. Thus it is crucial to develop new cockpit. Objective of this study is to design the ergonomic cockpit for electrical car satisfying user. Independent axiomatic design is a method to determine design parameter of the cockpit by mapping from costumer attributes and functional requirements. Anthropometric data of driver is used to support the design. Statistical analysis is conducted to test the hypothesis. On the basis of the study, it is revealed that the proposed electric car design corresponds to user requirement at 5% significance level.

Z0024 (Session 4) Presentation 5 (17:00~17:15)

Study on Paths of Corporate Proactive and Reactive Green Innovation under Multiple Institutional Pressures: Based on Fuzzy Sets Qualitative Comparative Approach

Litian Chen and **Qing Zhang**

Zhejiang Gongshang University, China

Abstract—In view of the research gaps of unclear mechanism on corporate proactive green

innovation and reactive green innovation under multiple institutional pressures, in this paper, ten observation phases from five manufacturing enterprises were taken as the research samples, and fuzzy sets Qualitative Comparative Approach (fsQCA) was adopted to conduct condition combination. As a result, three green innovation paths corresponding to proactive and reactive green innovations were found respectively. For proactive green innovation, the paths included: 1) capability stimulation type; 2) ethical stimulation type. For reactive green innovation, the path is flexible adaption type. To sum up, this article has theoretical contribution to the institutional theory and self-determination theory, and it has practical significance to corporate green innovation path selection and policy making.

Z0028 (Session 4) Presentation 6 (17:15~17:30)

Entrepreneurial orientation and sustainability in family firms

Drake Mullens

Tarleton State University, United States

Abstract—This research endeavors to examine the relationship between family firm generation, performance, and entrepreneurial orientation (EO) on investments in sustainability initiatives. The objective of this research is to establish EO as an important antecedent of investments in sustainability initiatives, assess EO's interaction with firm performance, and establish that later generation family firms are more environmentally and socially responsible. Data were collected in-person from 151 top managers in automobile and motorcycle dealerships in the Southwestern United States. Regression analysis was utilized to analyze the hypothesized relationships. The results indicate that EO is significantly and positively related to investments in sustainability initiatives. That relationship is dependent on the performance of the firm. At low levels of EO, higher performing firms invest significantly more in sustainability initiatives. However, at high levels of EO, low performing firms invest slightly more in sustainability initiatives. The generation of the family business is moderately related to sustainability investments with later generation family firms investing more. The findings herein bridge the gap between the entrepreneurship and sustainability literatures by establishing EO as an important antecedent of investment in sustainability initiatives. Further, the results indicate firm mechanisms, like EO, are more important than the performance of the firm or slack resources available.

Z0025 (Session 4) Presentation 7 (17:30~17:45)

Educative Doll Design as Media for Learning Indonesian Traditional Folk Song using Affective Design Approach

H Soewardi and **Siti Bariroh Maulidyawati**

Islamic University of Indonesia, Indonesia

Abstract—Over the past decade, modernity has become a mainstream factor of entertainment. Unfortunately, it makes traditional things be abandoned slowly, especially in Indonesia. However, the lack of traditional products that can attract users' attention is influenced by the designs from the manufacturers. Thus, the objective of this research is to develop an innovative education doll as media of learning Indonesian folk songs. *Kansei* Engineering (KE) method and Fuzzy Linguistics principle were used to design. More than 100 respondents

were involved in this study to identify the *Kansei* words. This is because these methods support emotional response of the users in affective design approach. Potential attributes in developing a new single concept design were analysed using Orthogonal array and conjoint analysis. Then, the data were analysed using statistical analysis. This study resulted in an innovative education doll that is proven to be valid in meeting the consumers' requirement.

Poster Session

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, April 28, 2018 (Saturday)

Time: 17:45~18:15

Venue: meeting room-1

Session Chair: Prof. CHOU Loke Ming

O0002 Poster 1 (17:45~18:15)

A new concept of jackup combined semisubmersible multifunction platform

Tian Ying Wang

Drilling Technology Research Institute, Shengli Petroleum Engineering Ltd., SINOPEC, China

Abstract—In order to overcome the shortcomings of the existing semisubmersible platforms, based on care investigation into various factors affecting the quality of floating platforms, a new concept of jackup combined semisubmersible multifunction platform named JCSM was developed. The JCSM integrates the advantages of the jackup platform and the semisubmersible platform. Also, the comprehensive performance of the JCSM is improved by optimizing the details of the topological structure. Therefore, the JCSM is well-suited for either wet tree or dry tree developments in harsh environments. Meanwhile, it possesses a variety of attractive functions covering drilling, early production, workover, oil and gas treatment, oil storage and unloading, and etc. Thus, a JCSM can be used throughout the entire life cycle of deepwater oil and gas field development, which can greatly help reduce the capex and opex and obtain higher economic benefit. The JCSM is an innovative alternative to the conventional semisubmersibles and a new choice provided for the development of offshore oil and gas fields in the future. The advantages of the JCSM was elaborated and analysed from mechanics perspective in the paper. This study will provide reference for the development of creative floating platforms.

O0011 Poster 2 (17:45~18:15)

Influence analysis of blade fracture of ducted propellers of offshore platforms on flow field

L J Ou, W Zhang

South China University of Technology, Guangzhou, Guangdong, China

Abstract—The flow field of ducted propellers in viscous flow is analyzed and calculated with CFD technology, and the flow field and surface pressure distribution of the ducted propeller of offshore platforms with the fracture in different positions of a certain blade are simulated. Firstly, the geometrical models of the ducted propellers are established with UG software and put into the girthing caved up by the Gambit. Then the numerical simulations are carried out with CFD, by which the surface pressure distribution of the ducted propellers in open water are calculated using Moving Mesh method. Lastly, the flow field characteristics of ducted propellers with the fracture in different positions of a certain blade are compared, and the result data are analyzed and summarized to gain flow field change laws. The results can be applied in project for reference.

O0019 Poster 3 (17:45~18:15)

Effect of touchdown trench modelling on SCR fatigue life

G. Hu, **C. Shi**, and Y. Zhao

China University of Petroleum, Qingdao, Shandong, China

Abstract—Touchdown zone (TDZ) is one of the most critical fatigue hot spot for a Steel Catenary Riser (SCR). In current industry practice, a flat profile is always used when modelling the seabed surface. However, survey data shows that trenches are formed at SCR touch down zone after riser installation. It is important to understand the impact of trench modelling for fatigue life at TDZ. This paper presents a SCR TDZ fatigue life comparison between a flat and trenched seabed profile using Finite Element Analysis (FEA) models based on linear soil stiffness. The trenched seabed is modelled in its assumed equilibrium condition using an analytical equation derived from non-linear hysteretic analysis in the literature. Further analyses are conducted for more parameters. The objective of this study is to determine if a linear seabed model with trenched profile can improve TDZ fatigue life of an SCR when compared to an SCR on a flat seabed surface.

O0024 Poster 4 (17:45~18:15)

Research on green remediation technology of oil spill by biosorbent

Dan Peng, Lei Nie, Fan Ouyang, Liuchun Zheng

Shenzhen Institute of Information Technology, Shenzhen, Guangdong, China

Abstract—Oil spillage is a serious problem all over the world. Usage of agricultural by-products for raw materials in biosorbents applications is a promising way to solve this problem. In this paper, a green biotechnological procedure has been developed using *Phanerochaete chrysosporium* to produce an oil-sorbent from corn stalk and corn cob. Without fungal modification, the maximum sorption of oil by raw corn stalk and corn cob was 6.95 g/g and 4.14 g/g, whereas the treatment with *Phanerochaete chrysosporium* increased up

to 9.03 g/g and 7.69 g/g, respectively. SEM and XRD were applied to characterization of treated and untreated materials, which showed the changes in the surface morphology and crystallinity of all biosorbents. The agricultural by-products can be utilized as biosorbent for efficient oil removal, and fungal treatment can serve as a mild and green method to increase the sorption capacity.

O0025 Poster 5 (17:45~18:15)

Numerical modelling of interaction between solitary wave and sloped seawall

Rui You and **Guanghua He**

Harbin Institute of Technology, Weihai, Shandong, China

Abstract—A numerical model for solving interaction between solitary wave and a sloped seawall is established. The CIP (Constrained Interpolation profile) scheme is employed to solve the flow field. THINC (Tangent of Hyperbola Interpolation for Interface Capturing) method is applied for capturing the free surface. Hydrodynamic forces is calculated by integrating the pressure and friction along the seawall surface. First, convergence tests with respect to mesh resolution and time step are examined, and the solitary wave profile is validated by experimental data from the published paper. Then, time series of the free surface elevation at specific location with different heights of incident solitary wave are presented. Finally, hydrodynamic forces acting on the weather side of the seawall are analyzed. The conclusion can be drawn that this numerical model has applicability for strongly nonlinear wave-body interaction problems.

O0032 Poster 6 (17:45~18:15)

Effect of different rotational speed on the cavitation of deep- sea mining pump under multiphase flow

Hailiang Xu, **Cong Xu**, Fangqiong Yang and Wei Chen

Central South University, Changsha, Hunan, China

Abstract—According to the phenomenon of cavitation in the deep-sea mining pump and the instability of the pump's speed, the pump's cavitation characteristic under different speeds is studied. Based on the theory of multiphase flow and cavitation nucleus, the Euler model and Schnerr-Sauer cavitation model are used to simulate the pump's steady state of cavitation under different rotational speed. The pressure distribution and gas volume distribution are analyzed as well as the pump's external characteristics, and it is verified by experimental. The results show that the low pressure and cavitation appears on the inlet of the impeller blade at the pump's first stage. Along the streamline direction, the pressure increases gradually and the gas disappears. With the rotational speed increases from 960r/min to 2000r/min, the area of the low pressure expands rapidly as well as the cavitation, the efficiency of the pump and the NPSHa drop to 30% and 1.05m respectively, the H adds to 90.89m. The calculation formula of the pump installation height is derived as (21). When the speed is the designed 1450r/min, the pump has the best installation position about 108m under the sea level.

O0035 Poster 7 (17:45~18:15)

Exploration application of BIM technology on artificial island engineering

Chao Dai, Hao Dong, Zhigang Zuo, Zhao Hailiang, Zhihui Shang

Tianjin, China

Abstract—With the continuous development of the transportation industry, the project of artificial traffic island is attracting more and more attention. However, the traditional design method has not met requirements for the complex structures of artificial islands. This paper discusses the application of BIM technology in the field of the design for artificial islands. Based on the practical engineering, the paper further proposes how to effectively use the BIM technology in the complex designs of artificial traffic islands, and presents the application effect. Finally, the BIM technology is successfully and effectively applied to the implement of 3D collaborative design, visualization of engineering design, and demonstration of construction progress.

O0037 Poster 8 (17:45~18:15)

Numerical study on influence of water exchange for artificial island group

Tao Liu, Yuehong Liu and Zhiqiang Hou

Tianjin Research Institute for Water Transport Engineering, Tianjin, China

Abstract—After the construction of artificial island group, the good water exchange ability is beneficial to improve the water environment quality and improve the land-scape effect of the island group. In order to solve the water exchange in the island group, a numerical model based on solving the hydrodynamic and advection-diffusion equations was used to calculate the water exchange of artificial island group in Weifang, China. The water exchange rate was obtained by calculating the concentration variation of dissolved conservative tracer. Based on the analysis of water exchange and influence factors, the suggestion of optimization was proposed. First the narrow waterways should be avoided and the most effective way to enhance the hydrodynamics for weak flow region is increasing exchange of channel.

O0038 Poster 9 (17:45~18:15)

Numerical simulation of the oil spilling impact on water environment.

Shanshan Yao, Peng Zhang and Qixiu Pang

Tianjin Research Institute for Water Transport Engineering, Tianjin, China

Abstract—Taking Ganyu Port project (PhaseI) as background, based on hydrodynamic and Euler-Lagrangian theory, a 2-D tidal current and oil spill numerical model are established and verified by measured data. According to different meteorological conditions, select representative scenes, the oil film sweep range and diffusion distance are predicted, and the oil spilling impact on surrounding water environment is analyzed. The results show that: the oil sweep range and drift track are closely related to the oil spilling time and wind direction. Under no wind condition, the farthest distance from the oil film edge to the oil spilling point is about 30 km in 72 hours, which will influence the present aquaculture area, but had no effect on the protected area. Under N and WNW adverse wind direction, the farthest distance

are respectively 32km and 67km from the oil film edge to the oil spilling point, which will both influence aquaculture area and some individual protected area.

O0039 Poster 10 (17:45~18:15)

Variation characteristics of tropical cyclones making landfall over China between 1951 and 2015 and their relationship with ENSO

Chenglin Gu, Jiancheng Kang, Guodong Yan , Zhiwei Chen , **Mingxing Niu**
Shanghai Normal University, Shanghai 200234, China

Abstract—Based on tropical cyclone (TC) data provided by the America Joint Typhoon Warning Center, this paper analyzes the variation characteristics of tropical cyclones making landfall over China during the 65-year period of 1951–2015 and their statistical relationship with the El Niño–Southern Oscillation (ENSO). The conclusions are as follows. (1) The landfall frequency during the period of 1951–2015 has strong inter-annual and inter-decadal variability characteristics, and an abrupt change in the landfall frequency occurred in 1988. However, from the long-term variation frequency trend, the landfall frequency decreased slowly from the late 1980s to 2015. (2) The landfall intensity increased rapidly from the late 1950s to the early 1960s, with an abrupt change occurring in 1996. In addition, there is a significant decreasing trend and then an increasing trend from the late 1960s to 2015. (3) There are significant negative correlations between the landfall frequency and the sea surface temperature (SST) in the ENSO-3.4 region. All the sliding correlation coefficients are negative from 1961 to 2002. A strong abrupt change in their correlation occurred in 1970, changing from a weak negative to a strong negative correlation. (4) There are no significant negative correlations between the landfall intensity and the SST in the ENSO-3.4 region, and their sliding correlation coefficient of inter-annual variability shows that there is an alternating appearance of positive and negative correlations. A strong abrupt change occurs in 1999, changing from a weak positive correlation to a strong negative correlation. The significant negative correlation occurred in the 2005. (5) The TC genesis locations move to the southeast in El Niño years and shift to the northeast in La Niña years. (6) TC frequency that influences the Chinese continental coast line in El Niño years is less than that which influences Japan. Meanwhile, in La Niña years, the TC frequency that influences Japan and its surrounding waters, the China Sea, the Bohai Sea, and the South China Sea, increases, while it decreases in the Taiwan Province.

O0043 Poster 11 (17:45~18:15)

Numerical simulation of wind wave in Bohai Sea induced by cold wave

Chen Chun and Huang Yu Xin

Tianjin Research Institute for Water Transport Engineering, Tianjin, China

Abstract—This paper using WRF mesoscale atmospheric model, the reanalysis wind field data provided by ncep global forecast field as the initial condition and boundary condition with time, calculated the wind field with sufficient precision, provided the driving wind field for the wave numerical calculation, calculated the corresponding wave field with model SWAN, and simulated the wind wave process caused by a cold wave wind in the Bohai sea area from 5 to 7 November 2015. The calculated model was verified by the measured wind

and waves data at the stations of Huanghua and Dongying. The results show that the simulation values of wind and wave elements are in good agreement with the measured values. The model can reproduce the characteristics of wind and wave distribution during the cold tide in Bohai Sea.

O0045 Poster 12 (17:45~18:15)

Experimental Study on Suspended Sediment Concentration and Powder Bed Deformation under Wave-Only and Wave-With-Current Scenarios

Zhaohui Wu, **Bo Yang**, Yang He, Fuxiang Huang, Bingchen Liang and Dang Zhao
Ocean University of China, Qingdao, Shandong, China

Abstract—In this paper, the suspended sediment concentration and bed geometric characteristics of powder sediment under the wave-only and wave-with-current are described. 9 experimental scenarios with the different wave height H and mean flow velocity V were investigated. It is found that under the wave condition the suspended sediment concentration S increases with the increase of wave height H , however it increases with the increase of flow velocity V under the wave-current condition. The sediment concentration in the near-bottom area is very high for both wave and wave-current condition. The sediment wave length L_{sw} increased slightly with the increasing of the H , but it does not change much in general, while it increased with the increasing of the V . The sediment wave height H_{sw} increased with the increasing H , and it increased firstly and then decreased with increasing V .

O0046 Poster 13 (17:45~18:15)

Experiment research on geometry and evolution characteristics of sand wave bedforms generated by waves and currents

Xiaohuan Zhu, **Zhenlu Wang**, Zhaohui Wu, Feilong Liu, Bingchen Liang, Yang He, and Fuxiang Huang

Ocean University of China, Qingdao, Shandong, China

Abstract—Sand waves generated under waves and wave-current have been investigated experimentally in a wave flume. The evolution of bedforms were measured by a Trasonic Terrain automatic Measurement and analysis System (TTMS). With the data measured, the configuration of the bed was analysed. With long time wave action, a large-scale bedforms as sand waves can be formed and many ripples superimposed upon them. Ripples with 2D or 3D patterns can be formed at different locations. The growth rate of sand waves was increased at the beginning and then decreased with the increase of the time. Moreover, it has been found that the sand wave features as sand wave length and height have relationship with hydrodynamics. In general, the sand wave height increases with the increasing of wave height and residual current respectively. The sand wave length increases with the increase of residual current and decrease of wave height. The sand wave growth rate increases with the increase of the hydrodynamic conditions.

O1004 Poster 14 (17:45~18:15)

The variation of extreme low temperature events in the Northwest Pacific under the Global Warming

Zhiwei Chen, Jiancheng Kang, Chenglin Gu, Yong Xu, Ming Tang, and Kai Lu
Shanghai Normal University, Shanghai, China;

Abstract—Under the background of global warming, the variation of extreme low temperature events in the Northwest Pacific are undergoing significant changes. The extreme low temperature events have obvious monthly, inter-annual and inter-decadal characteristics. Extreme low temperature events were mainly concentrated in January-March. It showed an increasing trend from 1982 to 1991, a downward trend from 1992 to 2011 and an upward trend from 2012 onwards. The frequency of extreme low temperature events has significantly reduced. The number of days and the duration of a single event have significantly reduced. The average temperature and the minimum temperature of a single extreme low temperature event show a linear upward trend. The extreme low temperature events have two time scales cycles, with a large cycle of 13-20a and small cycle of 4-10a. Over the past 33 years, extreme low temperature events have changed from small time-scale cycle to large time-scale cycle.

O3002 Poster 15 (17:45~18:15)

The Climatic Characteristics of Surface Salinity in the South China Sea and the Adjacent Northwest Pacific Ocean

Mingxing Niu, Jiancheng Kang, Zhiwei Chen
Shanghai Normal University, Shanghai, China

Abstract—Based on the high-resolution SODA (Ocean Data Assimilation) oceanographic hydrological reanalysis data, analyzing the climatic characteristics of the surface salinity in the South China Sea and the adjacent Northwest Pacific Ocean during the new climatic baseline period from 1981 to 2010 in this paper. The results showed that: (1) Sea surface salinity (SSS) in the research area could be obviously divided into two areas, the South China Sea and the Northwest Pacific Ocean. The SSS in the South China Sea was lower than that in the Northwest Pacific Ocean. The annual amplitude of SSS in the South China Sea varied in different sea areas, and it was smaller and almost same in the Northwest Pacific Ocean area. (2) The inter-monthly variations of SSS were the same at continental shelf side and the sea area near the island in the South China Sea, however differences existed with that in the central of the South China Sea. The inter-monthly variation of SSS in the Northwest Pacific Ocean varied from low latitude to high latitude and the salinity field showed "high-low-high" distribution. (3) According to the climatic characteristics of salinity, the research area could be divided into five climatic zones. Among them, the South China Sea was divided into areas A and B, and the Northwest Pacific Ocean was divided into areas C, D, and E. As water invading from the Northwest Pacific Ocean to the South China Sea area that caused a higher salinity in area B than in area A. The northern equatorial current influenced on the Northwest Pacific Ocean, that caused the salinity in area D lower than in areas C and E.

Z0006 Poster 16 (17:45~18:15)

Construction method of telecommunication system for corrective information distribution

V V Karetnikov, S F Shahnov and A A Ageeva

Department of Navigation on Inland Waterways, Admiral Makarov State University of Maritime and Inland Shipping, Russia

Abstract—The paper presents a methodology for optimal construction of telecommunication system for corrective information distribution based on the criterion of minimizing of expendable resources. A calculation method of range of control and correction stations (CCS) action transmitting the corrective information to mobile consumers under various conditions (sea, land areas with various electrical properties) is developed. A construction algorithm of the optimal telecommunication system has been created. The software in the software shell MATHLAB was developed for implementation of the obtained algorithm. The obtained algorithm and the developed program were tested. The results of comparison of calculations with the analytical solution and experimental data for the specific example are given. These results gave a good matching between the computations obtained by the algorithm and the analytical calculations. The developed algorithm and program were applied to optimize the composition of CCS of the local differential subsystem in the rivers basins of Siberia and the Far East. An example of the formation of action zones of CCS in the basin of the Ob River on inland waterways of Russian Federation is given. In conclusion, the inference is made about the effective optimization of the local differential subsystem, as a result of which it became possible to provide all inner waterways in the Ob basin by a continuous field of the differential correction.

Z0010 Poster 17 (17:45~18:15)

Functionalization of recycled diatomite for green, stable, and high-performance phase change material (PCM) composite

Yeng-Fong Shih, **Chih-Hung Wang**, Zong-Gi Tson, Yu-Cheng Zhang and Hong-Yuan Lian

Department of Applied Chemistry, Chaoyang University of Technology, Taiwan

Abstract— This study reports on the functionalization of recycled diatomite (DT) for preparing green and shape-stabilized phase change material (SSPCM); the DT-based SSPCM can be employed in HDPE composite for high latent heat and good thermal conductivity. After purification, the purified DT (P-DT) adsorbed polyethylene glycol (PEG) by the straight dipping process for producing SSPCM. P-DT showed high surface area of 58 m²g⁻¹ and low organic impurity (<1%); the PEG/P-DT SSPCM exhibited high latent heat of 45 Jg⁻¹ and low leakage (<0.3%). By adding PEG/P-DT SSPCM into the HDPE, the SSPCM/HDPE composite improved both the heat deflection temperature (HDT) and maximum decomposition temperature (T_{max}) to 89.18°C and 500.2°C, respectively. In seeking to enhance tensile strength and thermal conductivity, maleated polyethylene (MAPE) and alumina (Al₂O₃) were studied in the SSPCM/HDPE composite. In the end, the SSPCM/HDPE composite exhibited great heat resistance, mechanical property and thermal conductivity.

Z0011 Poster 18 (17:45~18:15)

Eco-friendly modification for the cellulose nanofibers derived from pineapple leaves for high-performance nanocomposite

Yeng-Fong Shih, **Zong-Gi Tsou**, Chih-Hung Wang and Hong-Yuan Lian

Department of Applied Chemistry, Chaoyang University of Technology, Taiwan

Abstract—This study extracted cellulose nanofibers (NFC) from pineapple leaves, and then employed eco-friendly aqueous system to modify NFC with a layer of polystyrene (PS). The successful modification was confirmed by FTIR analysis, after acid-base treatment can effectively reduce the lignin content and better water transport, and the PS layer could lower NFC's surface polarity for improving the interfacial compatibility in PS matrix. By introducing NFC into PS matrix, the PS-modified NFC showed better interfacial adhesion and uniform dispersion, and resulted nanocomposite with higher tensile strength, char yield and transparency. Therefore, the eco-friendly modification could help NFC reinforce nanocomposite for enhancing mechanical property, thermal resistance and transparent appearance.

Z0034 Poster 19 (17:45~18:15)

Pollution Control Policy and Technology Research Status of Construction Land

NIU Yan

Institute of Land Engineering and Technology, Shaanxi Provincial Land Engineering Construction Group Co., Ltd., China

Abstract—In some cities with high levels of urbanization, on the one hand, there is an urgent need for transformation and upgrading, and the land resources are extremely precious. On the other hand, the urban environment is overwhelmed. The construction land used for urban renewal has hidden environmental risks and the human settlement environment is relatively high. influences. Soil pollution may cause greater harm to human health, and it has become one of the prominent shortcomings in building a well-to-do society. In view of the problems existing in the quality of construction land, especially the pollution of construction land, many countries have formulated corresponding policies and governance techniques. Through reading a large number of documents, this paper summarizes the research status of domestic and foreign policies and technologies in the treatment of land-use pollution. , for the relevant research to provide a reference.

Z0043 Poster 20 (17:45~18:15)

An Approach for Analysis of Natural Hazard Impacts on Activated Sludge Wastewater Treatment

P Zlateva and N Dimitrova

Institute of Robotics, Bulgarian Academy of Sciences, Sofia, Bulgaria

Abstract—The activated sludge process is a advanced biological wastewater treatment process for treating sewage or industrial wastewaters by using different aerobic types of microorganisms (biomass). In recent years, the activated sludge processes are shown to be

significantly negative affected by the natural hazards (the climate factors) as extreme temperatures, intensive rainfall, etc. An approach for analysis of natural hazard (climate change) impacts on wastewater treatment process with activated sludge is proposed. The approach is based on qualitative analysis of the input-output static characteristics of the activated sludge process, involving uncertainties in the inflow parameters of the aerobic bioreactor. The process model is described by the system from two nonlinear ordinary equations with interval coefficients. The impact levels of one natural hazard on the activated sludge process are defined as a deviation between the nominal and the affected input-output characteristics. The negative effects are described by variation in given intervals of some process coefficients and are calculated as percentages (deviations) from the nominal process coefficients. This analysis of natural hazard impacts on activated sludge wastewater treatment process is necessary in order to operate such system stable and efficiently.

Z1001 Poster 21 (17:45~18:15)

The Influence of the Storage Strategy on the Complexity of the Container Selection Procedure

A L Kuznetsov, A V Kirichenko and O A Izotov

Admiral Makarov State University of Maritime and Inner Shipping, St. Petersburg, Russia

Abstract—The paper deals with the practically and theoretically important problem of the container selection from the stacks of the container yard. This problem to a great extent determines the operational efficiency of the modern specialized maritime and dry container terminals. The severe ecological pressure exposed on the terminals ruled out the extensive way of the terminal development by the territory expanding. The permanent growth of the container flows leaves the only dimension to expand, to go high. In the same time, the increase in the operational height of container stack causes another big problem, that of container selectivity. With the growth of the number of tiers in the stack, the number of non-productive moves is also bigger, thus deteriorating the operation efficiency of the container yard. The results of the study shows that this problem could be fought by the changing the operational strategy of the box allocation in the container blocks of container yard. The benefits resulting from the changing of the strategy from the traditional horizontal filling of the empty space cell by cell and tier after tier to the vertical allocation of the boxes in sequential columns and rows are displayed on the concrete samples. This problem cannot be solved by the analytical mathematical techniques and should be treated with computer simulation.

Z0046 Poster 22 (17:45~18:15)

The validity examining of detection for label-free Escherichia coli and Enterococci in ships ballast water

M M Maw, J S Wang, K Z Yu, Y J Wang, B W Dai, X D Wu and X X Pan

Abstract—To test for compliance with the D-2 standard for ballast water management convention of the International Maritime Organization, the bacteriological quality of ship's ballast water is determined to evaluate the risk of invasion of non-indigenous species both onboard ship and in Port. In this article, hydrodynamic flow focusing on particles viewed through a microfluidic resistive pulse sensor (MRPS) was used to detect the pathogenic

bacteria from ship's ballast water. *Escherichia coli* and *Enterococci* were used as bacterial indicators to determine their characteristic and concentration. The system provided the individual particle-by-particle readout in rather large 20 μm x 10 μm x 8 μm (length x width x height) horizontal rectangular microchannel duct. The average volume flow rate was 4.5 $\mu\text{l}/\text{min}$. However, it returned online and real-time results for a complete of 30 μl sample volume during 15 min. The system proved to be low maintenance, high in sensitivity, good in accuracy and reliability. Targeted bacteria needed neither labelling nor the extraction of DNA. There is no side effect on the environment.

Listeners

Name	Affiliation
Xin Fang	The Second Institute of Oceanography, Zhejiang, China
Pingting Lian	The Second Institute of Oceanography, Zhejiang, China
Xiaochen Han	Jiangsu University of Science and Technology, Zhejiang, China
MGBEKWUTE CHIGOZIE MICHEAL	MAKAKWUTE INNOVATIVE LIMITED, NIGERIA

Half-Day Academic Visit

Shanghai Maritime University



Shanghai Maritime University (SMU) is a multi-disciplinary university that encompasses such areas as engineering, management, economics, law, liberal arts, and science, with a special emphasis on shipping technology, economics and management. Chinese maritime education originated at Shanghai and grew out of the Shipping Section of Shanghai Industrial College founded in 1909 (towards the end of the Qing Dynasty). SMU was established by the Ministry of Communications in 1959. According to the university layout adjustment in Shanghai, and for better service of construction of Shanghai international shipping center, Lingang new campus inaugurated in 2008.

Time: 9:00~12:00 on April 29, 2018 (Sunday)

8:45 Gathering in Shanghai Maritime University

1. 9:00~09:40 Ship Handling Simulator



The Ship Handling Simulator creates the bridge operation in various shipping environments with different scenarios to train crew members in basic navigation, watch keeping, collision avoidance techniques, communications, low speed manoeuvring, emergency procedures, search and rescue, as well as other naval tactics.

2. 09:40~10:20 Marine Engine Room Simulator



Turbine Simulator (Marine Engine Room Simulator) is a kind of realistic by computer simulation of actual ship Engine Room which has the function of the devices and displays it. It provides a more complete real-time operating platform.

3. 10:20~11:00 **Integrated Engine Room Laboratory**



The main systems of turbine laboratory:
The main propulsion system
The ship piping
Marine power station system
Engine room automation system
Diesel engine digital monitoring and diagnosis system

4. 11:00~11:30 **Wind Tunnel Laboratory**



The wind tunnel facilities are used for the experimental research on co-flow jet flow control airfoil and jet-boat tail passive flow control for base drag reduction.

5. 11:30~12:00 **Hybrid Liquid Cargo Ship Mock-up**



A tanker (or tank ship or tankship) is a merchant vessel designed to transport or store liquids or gases in bulk. Major types of tankship include the oil tanker, the chemical tanker, and gas carrier. Tankers also carry commodities such as vegetable oils, molasses and wine. In the United States Navy and Military Sealift Command, any type of tanker used to refuel other ships is called an oiler.

(Tip: The arrangement above is for reference, and the final schedule should be adjusted to the actual notice.)



Feedback Information

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2018 HKCBEEES SHANGHAI CONFERENCE

<p>Would you please list the top 3 to 5 universities in your city?</p>	
<p>Other Field of Interest</p>	
<p>Any Other Suggestions/Comments</p>	

Thank you for taking time to participate in this conference evaluation. Your comments will enable us to execute future conferences better and tailor them to your needs!