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21ST IAHR INTERNATIONAL SYMPOSIUM ON ICE 2012

JUNE 11 – 15, 2012, DALIAN, CHINA

BY ZHIJUN LI, PENG LU

The 21st IAHR International Symposium on Ice was held at the International Convention Center of Dalian University of Technology in Dalian, China, from June 11 – 15, 2012. Altogether 119 papers were presented in poster and oral sessions. The orals were divided into three parallel series 1) Ice engineering, 2) Sea ice and lake ice properties and characteristics, and 3) River ice processes, ecology under ice and measurement technology, with nearly equal numbers in each series. Each day started with invited talks for all participants, and thereafter the three parallel sessions were started.

Programme

The symposium was completed in five days. Oral presentations were given in 3.5 days, and half of the day was set aside for visiting the Dalian University of Technology (Exhibition of University History, State Key Laboratory of Coastal and Offshore Engineering, School of Naval Architecture).

The official opening was given by Professor Guohai Dong, President of State Key Laboratory of Coastal and Offshore Engineering, Dalian University of Technology. After that, the Greetings from Professor Zhaoyin Wang, Vice-Chairman of IAHR, Senior Research

Scientist, Jizhang Gao, Chairman of IAHR China Chapter, and Professor Patricia Langhorn, Chairman of IAHR Ice Research and Engineering Committee were given.

Ice engineering sessions included Ship dynamics in ice, Sea ice induced vibrations, Ice management, Laboratory and physical model studies, Ice loads on structures. Sea ice and lake ice properties and characteristics sessions consisted of Ice physics and mechanical properties, Water quality and ecology, Sea ice characteristics, Ice ridges and icebergs, Ice-waves interactions, River ice remote sensing and data collection techniques, Yellow River ice

condition forecast, impacts of climate change and engineering. River ice processes, ecology under ice and measurement technology sessions included River ice processes, Ice resources and climate changes, Combating methods of oil spills in ice, Sea ice remote sensing and measurement technology, and a special session on lake ice physical environments under lake ice, Ecology and water quality in ice-covered lakes.

The number of participants was 171 representing 12 countries. There were 89 participants from the host country,

Invited presentations

Invited presentations were given in the opening session by Professor Yongxue Wang (Dalian University of Technology, Dalian, China), who gave a keynote talk on "Ice research and engineering in SLCOE", and Professor Aleksey Marchenko (The University Centre in Svalbard, Longyearbyen, Norway), who talked of "Measurements of thermally-induced deformations in saline ice with fiber bragg grating sensors". Dr. Xingren Wu (NCEP/NWS/NOAA, Camp Springs, Maryland, USA) lectured on "Characteristics of sea ice in the NCEP climate forecast system reanalysis", Professor Pat Langhorne (University of Otago, Otago, New Zealand) lectured on "Influence of a sub-ice platelet layer on landfast sea ice freeboard and thickness estimates near an Antarctic ice shelf", Dr. Georgiy Kirillin (Leibniz-Institute of Freshwater Ecology and Inland Fisheries, Berlin, Germany) lectured on "Convective mixing by solar radiation under lake ice", and



Dr. Kari Lampela (Finnish Environment Institute, Helsinki, Finland) lectured on "Baltic Sea experiences in mechanical oil recovery in ice". Dr. Kailin Yang (Institute of Water Resources and Hydropower Research, Beijing, China) lectured on "Safety regulations of middle route Project of South to North Water Diversion in winter-spring period", Professor Yasuharu Watanab (Kitami Institute of Technology, Kitami, Japan) lectured on "Tsunami run-up to the ice covered rivers in Hokkaido at the 2011 great east Japan earthquake".

Awards

The Best Student Paper Prize was granted to Ian M. Knack, whose presentation was entitled "River ice modeling for fish habitat analysis". He is a student in Clarkson University, Potsdam, USA and was the first author of the awarded paper with the co-author of Hung Tao Shen. The other Best Student Paper Prize was granted to Wenjun Lu, whose presentation was entitled "Ventilation and backfill effect during ice-sloping structure interactions". He is a student in the Norwegian University of Science and Technology, Trondheim, Norway and was the first author of the awarded paper with the co-authors of Sveinung Løset, and Raed Lubbad. This award was established in 1994 and in total thirteen students have been granted the award.

Scientific topics

The articles and presentations in this congress relate to all aspects of ice researches, and are especially associated with the topic of the congress "ice research for a sustainable environment". They do not only present advances in ice research, but also reveal the improved concerns on the sustainable development and environmental problems.

Ice physical and mechanical properties are the bases for studies on ice dynamics and thermodynamics. Laboratory experiment is still the main method employed on such research, but numerical modeling also begins to express some advantages on calculating ice properties, such as Ji of Dalian University of Technology and Bai of Bohai University.

There is a long history of river ice study, and it was also an important topic of the congress. On the river ice processes, except for the traditional ice dam and ice jam, a study on the influence of tsunami on river ice after the earthquake from a Japanese scientist attracted much attention. Because under the background of global warming, such kind of ultimate natural disaster and weather accident may occur more frequently - but similar studies on ice are few.

Besides, for ice observation technology, more remote sensing methods have been employed in monitoring of river ice. For example, a UAV of Chinese Academy of Sciences had been used in ice observations in the Yellow River. Water quality and ecology under ice is tightly associated with the congress topic, field observations and numerical modeling on the Porcupine River, Amur River and the Songhua River were presented here as examples. Moreover, ice management is important for all ice-infested rivers where river structures are expected to survive the winter ice conditions. Nine papers from different countries were concerned with this topic, and most of them were related with real engineering problems. Except the methods on ice conditions observations, they were concerned with a more systemic method of ice management instead of simply defeating the ice disaster. Ice problems in the Yellow River of China was another main concern of the congress, with twelve papers from different institutes and companies presenting the ice conditions, ice disaster and anti-ice measures in the Yellow River.

Presentations on sea ice characteristics were focussed on the Arctic Oceans and sub-Arctic seas such as the Bohai Sea, and on the spatial and temporal distribution of sea ice, ridges and icebergs. Besides, the relationship between sea ice change and global climate, ice zone environment protections are issues tightly associated with the theme of the congress, and thus also received much attention.

Interaction of ice on structures is a traditional issue in ice studies. Except for the static ice force on fixed structures, the congress focussed more on dynamic ice forces such as ice induced vibration. Especially, a study comprising three papers from the Norwegian University of Science and Technology presented a systemic experiments on ice induced vibration, and received much attention from the attendees. On the other hand, owing to the rapid decay of Arctic sea ice and increased possibilities in using Northern Route through the Arctic Ocean, more and more projects have been carried out to study ship capability in ice-infested regions, and methods of physical modeling, numerical modeling and in-situ observations are employed in such researches.

Lake ice is a special section organized in this congress. Although it has a smaller spatial scale than sea ice in the polar regions, the influence from climate change is also significant, and in-situ observations on lake ice are always easy to conduct. Articles on lake ice in the congress



Zhijun Li, Chairman of the Scientific Committee of 21st IAHR Ice Symposium. Professor Zhijun Li is professor in Dalian University of Technology, China. His professorial research field is sea ice physics and mechanics.



Peng Lu, State Key Laboratory of Coastal and Offshore Engineering, Dalian University, China. Peng Lu is currently at Dalian University of Technology, as an associate professor. His interest includes sea ice dynamics, and image processing in sea ice remote sensing.

mainly concerned topics such as the ice optical properties, thermodynamic properties, water quality and ecology under lake ice.

Proceedings

The Symposium Proceedings was published on USB and paper version. The PDF proceedings will be available free in IAHR web site later on the year.

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Next Symposium

It was announced that the 22nd IAHR International Symposium on Ice will be held in Nanyang Technological University, Singapore in August 18–22, 2014. Invitation to Singapore was given by Associate Professor Adrian Wing-Keung Law.