International Conference on Marine Simulation and Ship Manoeuvrability 2012 (MARSIM 2012)

Singapore
23 - 27 April 2012
# TABLE OF CONTENTS

**KEYNOTE ADDRESS**

IMPROVING SHIPPING SAFETY AND ECONOMY THROUGH SIMULATION

A Prof. Capt. S.J.Cross, Chairman IMSF

**SESSION 1/1**

New Challenges For Maritime Safety And Security Simulation Based Training With The Safety & Security Trainer

C. Felsenstein, K. Benedict, M. Baldauf

Automated Assessment - Benefits And Limitations

L. Markasson, A. Nordholm

Gaming Meets Training – The ‘Teamsafety’ Project

S. Gosling

**SESSION 2/1**

An Object-Oriented Approach To The Development Of Marine Technological Simulators In Transas

S. Tarasov

Development Of A Mathematical Model Of A High Speed Catamaran Ferry For Simulations In Hard Weather During Arrival Based On Pmm And Seakeeping Model Tests

J. Otzen, C. Simonsen

Designing Simulators To Maximize Knowledge Transfer

S. MacKinnon, A. Patterson, R. Billard, J. Power, B. Veitch, S. Power-MacDonald, A. Baker, A. Simoes

**SESSION 3/1**

Virtual Creative Tool – Next Generation’s Simulator

M. Lundh, S. Mallam, J. Smith, B. Veitch, R. Billard, A. Patterson, S. MacKinnon

A Holistic Approach To Maritime Offshore Simulator Training

S. Veierland, G. Lijie

Deep Water Anchor Handling Simulation

N. Leith, A. Ditzel

**SESSION 4/1**

The Use Of Linked Simulators In Project “Horizon”: Research Into Seafarer Fatigue

M. Barnett, C. Pekcan, D. Gatfield

System Engineering Of A Total Ship Training System For A High Speed Vessel

E. Miller, K. Gilman, K. Robinson, D. Topping

Development Of Laptop-Based Pilots’ Ship-Handling Simulator

T. Jeong, C. Chen, S. Lee, J. Lee, Y. Huh

**SESSION 5/1**

Enhancing OICNW Shipboard Training: Advanced Marine Simulation On A Training Ship

P. Leyda, S. Browne, D. Coleman, T. Messer

A Study On Essential Competence For Inexperienced VTS Operators

T. Nishimura

Automation And Error Trapping: Organisational And Individual – Cultural Change And Using Technical As Well As Non-Technical Skills In Error Management

R. Singh

**SESSION 6/1**

Challenges In Maritime Training And Assessment

G. Sangameswar

Analysis Of Full Ship Types In High-Blockage Lock Configurations

J. Vervilligen, J. Richter, D. Reddy, M. Vantorre, K. Eloot


J. Fukuto, K. Hasegawa, R. Miyake, M. Yamazaki

**SESSION 7/1**

Ship Maneuvering On Simulators: Expert Evaluations Versus Quantitative Characterization

V. Frette, G. Kleppe, M. Vold, K. Christensen

A Study Of The Anti-Current Autopilot Design Concept By Using A Shiphandling Simulator

S. Lee, C. Tseng, Y. Kehr


D. Bonfim, M. Molinari, M. Goncalves
### SESSION 8/1

**Simulator Application For Decision Making Prior To Admission On The River Rhine In Basel** ............................................. 196  
A. Gronarz, P. Sauter, S. List

**A Study Of Maritime Simulator Applications On Taiwan's Navigation Education Curriculum** ........................................ 203  
T. Jong, J. Wang, Z. Tseng

**Inland Navigation: Assessing The Manoeuvring Behaviour For Real-Time Simulation Purposes** ................................... 213  
K. Eloot, G. Delefortrie, M. Vantorre

---

### SESSION 1/2

**Black-Box Modeling Of Nonlinear Hydrodynamic Model For Ship Manoeuvring Based On Support-Vector-Regression** ................................................................. 225  
X. Zhang, Z. Zou

**Simulating Wind And Currents To Improve Future Ship Operations In The Port Of Rotterdam** ........................................ 233  
H. Wijhe

**Investigation On The Interaction Between Ship Propulsion Control System And Manoeuvrability By Time Domain Simulation** ......................................................... 246  
M. Alhosse, M. Figari, M. Martelli, M. Viviani

---

### SESSION 2/2

**Mathematical Modeling Of Towage Operation For Interactive Tug Simulator** ................................................................. 256  
J. Ren, X. Zhang, X. Sun

**Squat In Open And Confined Canals: Comparison Between Empirical Methods And Towing Tank Measurements** ................................. 267  
E. Lataire, M. Vantorre, G. Delefortrie

**Modeling Optimal Colregs-Based Navigational Paths In Port Waters** ................................................................. 282  
Y. Wang, H. Chiu

---

### SESSION 3/2

**Mathematical Model For Manoeuvring Of Twin-Propeller Twin-Rudder Ship Considering Peculiar Rudder Normal Force Phenomenon** ................................................. 292  
S. Khanfir, K. Hasegawa, E. Kobayashi, V. Nagarajan

**CFD Prediction Of Free-Running SES/ACV Deep And Shallow Water Maneuvering In Calm Water And Waves** .................. 305  
S. Mousaviriaad, S. Bhushan, F. Stern

**Sea Trial Validation On The Manoeuvring Performance For The 8200 TEU Container Ship** ............................................. 330  
C. Fang, C. Lin, J. Tsai

---

### SESSION 4/2

**On A Pragmatic Analytical 4-Quadrant Propeller-Rudder Model** ................................................................. 337  
W. Hwang

**Investigation Of Ship-To-Ship Interaction For A Bridge Simulator** ................................................................. 355  

**Fin Stabilizers Hydrodynamic Model And Simulation Platform Of “YUKUN”** ................................................................. 362  
Z. Xinfeng, J. Yicheng, Y. Yong, S. Xiaofeng

---

### SESSION 5/2

**Application Of MMG Model Simulations To Twin-Propeller, Twin-Rudder Car-Passenger Ferry In Port Manoeuvring Conditions** ................................................................. 367  
R. Maciej

**Theoretical And Experimental Study On The Towing Stability Of The Large Offshore Floater System Under The Various Environmental Forces** ........................................... 375  
H. Yang, Y. Wada

**Risk Analysis Of DP Operation Using Bow-Tie Diagram** ................................................................. 386  
K. Shukla

---

### SESSION 6/2

**Stopping Simulations And Sea Trial Measurements Of A Ship With Diesel-Electric Propulsion And Controllable Pitch Propellers** ................................................................. 392  
J. Schoop-Zipfel, M. Abdel-Maksoud, K. Tijges

**Simulating Traffic In Waterway Network Based On Gap Acceptance Theory** ................................................................. 407  
L. Chen, J. Mou, J. Dai, M. Zhao

**Estimation On Ship Maneuverability Based On The Correlation Between Hydrodynamic Force And Moment** ................................................................. 417  
M. Sugisawa, H. Kobayashi
SESSION 7/2
Numerical Prediction Of Flow Field Around A Ship Drifting ................................................................. 428
O. Amin, K. Hasegawa

Optimal Search Efforts Allocation Algorithms In Maritime Search And Rescue Decision Support System ................................................................. 435
F. Xiao, Y. Yin, Y. Jin, H. Shen

A Study On Effect Of The Self-Propulsion Points In PMM Tests For KVLCC’s Manoeuvrability .................. 449
S. Shin, K. Akin, Y. Sang, S. Oh

SESSION 8/2
Tackling The Rotor Tug Challenge .............................................................................................................. 458
P. Sorensen, A. Damsgaard, J. Nielsen

A Study On Interaction Coefficients Between Hull And Rudder In Maneuvering Model Using CFD .................. 465
Y. Fukui

Experimental Study On Bank Suction ...................................................................................................... 472
H. Ibaragi, Y. Nakiri, Y. Furukawa

SESSION 1/3
Experimental Investigation Of Asymmetrical Propeller Behaviour Of Twin Screw Ships During Manoeuvres ......................................................................................... 482
A. Coraddu, G. Dubbioso, D. Guadalupi, S. Mauro, M. Viviani

Hydrodynamic Database And Manoeuvring Prediction Method With Medium High-Speed Merchant Ships And Fishing Vessels .............................................................................. 494
Y. Yoshimura, Y. Masumoto

Flow Field Simulation Of Bridge Group Area Considering Cross-Bridge Opening ........................................ 504
L. Liu, M. Liu, J. Liu, Y. Xu, L. Zhou, Y. Sun, Y. Wei

SESSION 2/3
The Ship Of 2020 And The MET Required .................................................................................................. 510
R. Short

The Effects Of Sedimentation On Navigation Environment In A Tidal Domained Estuary Through Numerical Modeling Study ..................................................................................... 518
P. Bhaskaran

Experimental And Theoretical Investigations On The Vertical Motion Of A Semi-Displacement Vessel With Appendages In High-Speed Region ......................................................................... 534
D. Kim, S. Lee, Y. You, J. Go, K. Rhee

SESSION 3/3
Maneuvering Performance Of Ships In Calm Water With Variable Finite Water Depths ...................................... 542
R. Skejic, K. Kirimoto, T. Berg, E. Pedersen

Optimal Propeller Design When Accounting For The Manoeuvring Response Due To Environmental Loading ......................................................................................................................... 551
D. Trodden, M. Woodward

How To Get Out Of This Rut Trap .................................................................................................................. 567
S. Sarma, A. Ramachandran, V. Balasubramanian

SESSION 4/3
Performance Analysis Of Single-Propeller/Twin-Rudder System By Computational Fluid Dynamics ........................ 588
T. Arii, A. Kobayashi, K. Hasegawa

Study On Ship-Ship Hydrodynamic Interaction By ANN Optimization ......................................................... 602
Y. Xu, Y. Sun, Y. Wei, H. Guan, M. Liu, W. Cai

Comparison Of Experimental And CFD Results For A Tanker Like Vessel .................................................. 612
G. Dubbioso, D. Durante, R. Broglia, S. Mauro

SESSION 5/3
Maneuvering Fullscale Trial Of A Ship With Azimuth Propellers To Capture The Trim Effect ................................. 623
N. Hirata, H. Yasukawa, H. Ukita

Investigations Of Ship To Ship Interaction Phenomena On The Example Of Wigley Body With The Use Of CFD Methods ............................................................................................................. 633
D. Nikushchenko, A. Zubova, A. Chetvertakov

Nonlinear Motion Stability Analysis For A High-Speed Container Ship ................................................................... 639
P. Reddy, V. Nagarajan, A. Chatterjee, O. Sha

SESSION 6/3
Analytical Criteria For Collision Avoidance Between Two Encountering Ships .............................................. 654
J. Park, J. Kim, N. Son
Investigation Of Ship-To-Ship Interaction During A Lightering Operation In Shallow Water Using A RANS Solver .............................. 660
L. Zou, L. Larsson

Training On Closed-Loop Communication With A Main Engine Stand-By Sequencer ............................................ 671
M. Sugimoto

SESSION 7/3
Fractal Analysis For Short-Term Vessel Traffic Flow ................................................................. 678
H. Rong, J. Mao, W. Guo, J. Liu, L. Xiong

How To Improve Engine Room Performance, Reliability And Reduce The Environmental Impact By Training .............................................. 688
J. Ullakonoja

Human Error And Workload From The Viewpoint Of Quantitative Difficulty Of Navigation .................. 695
A. Uchino, H. Kobayashi

SESSION 8/3
MARIS ECDIS900 - The Leader.............................................................................................. 704
B. Gandhi

Experimental Study On Ship Operation In Close Proximity To Bank Channel ..................................... 729
M. Sano, H. Yasukawa, H. Hata

The Influence Of Ship Maneuverability Modelling On The Navigational Safety Assessment Result .......................... 739
I. Gong, Y. Yang, K. Yun, S. Park, J. Oh, S. Kim, M. Jeong, T. Seo, M. Baek

SESSION 4/4
Simulation, An Effective Tool In The Risk Management Of Vessels Under Pilotage .............................................. 749
J. Lloyd, I. Rodrigues

Training For Heavy Lift And Offshore Teams With Rheinmetall Simulation ........................................ 758
A. Oesterle

An International Perspective Of Similarities And Variance In Simulator Utilization In Ship Master Training .............................................................................. 765
M. Rudrakumar

SESSION 5/4
Bottom Wash Assessment Using A Full Mission Ship Handling Simulator ............................................. 781
M. Perkovic, M. Batista, V. Malacic, D. Zagar, S. Jankowski, L. Gucma, M. Gucma, D. Rostoppshin

New Technologies For Multiple Projector Display System Challenges ............................................. 792
P. Laney

Fast Time Manoeuvring Simulation As Decision Support For Planning And Monitoring Of Ship Handling Processes For Ship Operation On-Board And Training In Simulators ......................................................... 803
K. Benedict, M. Kirchhoff, M. Gluch, S. Fischer, M. Schauh, M. Baldauf, S. Klues

SESSION 6/4
Research On Wave Generating And Absorbing In Ship Viscous Numerical Wave Tank ........................................ 820
J. Lian, Y. Yin, X. Yang, S. Gao

New Approaches To Education & Training ....................................................................................... 828
N. Karthkeyan

Advanced BTM Training Beyond Revised STCW In 2010 ...................................................................... 840
H. Kobayashi

SESSION 7/4
Measuring Workload And Performance During Complex Manoeuvres, Both On A Manoeuvring Simulator And On Board .............................................................................. 852
W. Uitterhoeve, R. Roos, P. Kluetenaar, P. Valk, D. Hove

Effects Of Rising Fuel Costs On Container Shipping Networks .......................................................... 866
K. Shintani, A. Imai

A Study On The Method Of Inferring The Collision Ratio Based On The Numerical Simulation By Considering Environmental Factors ............................................. 873
Y. You, K. Rhee

SESSION 8/4
Digitalization Of Seafarer's Document ................................................................................................. 892
S. Roy

Realistic Rendering Of Ship Waves For Marine Simulator ......................................................................... 901
H. Shen, Y. Yin, X. Sun, X. Liu, F. Xiao

Author Index