



Wednes ay 8 March	8:30- 10:30	Observatory and Disaster Mitigation 2 Chairs: Masanao Shinohara, ERI, University of Tokyo and Narumi Takahashi, National Research Institute for Earth Science and Disaster Resilience	8:30- 8:50	7.1	Introduction to Indonesian Cable-based Subsea Tsunameter Michael Andreas Purwoadi, Wahyu Widodo Pandoe, Andi Eka Sakya, Yudi Anantasena, Joko Widodo National Research and Innovation Agency	2082	REMO	Marine Robotics 3 Chairs: Yu-Cheng Chou, National Sun Yat-sen University and Akihiro Okamoto, National Institute of Maritime, Port and Aviation Technology	8:30- 8:50	8.1	A Position Correction Model for AUV Navigation with Sequential Learning-Assisted State Estimation Xin Zhang <sup>1,2</sup> , Yiping Qiu <sup>2</sup> , Akihisa Ohya <sup>2</sup> , Ayanori Yorozu <sup>2</sup> and Bo He <sup>1</sup> <sup>1</sup> Ocean University of China, <sup>2</sup> University of Tsukuba	2024	
			8:50- 9:10	7.2	Precise bathymetry with an underwater vehicle for seafloor crustal movement observation Shuhei Nishida, Yuya Machida, Hiroyuki Matsumoto and Eiichiro Araki, Shojiro Ishibashi JAMSTEC	2030			8:50- 9:10	8.2	Mechanical Imaging Sonar-based AUV Wall Following in a Water Tank Yu-Cheng Chou, Hsin-Hung Chen, Jia-Chi Jiang, Chau-Chang Wang National Sun Yat-sen University	2044	
			9:10- 9:30	7.3	Simultaneous seafloor seismic observation by distributed acoustic sensing and accelerometer using off-Sanriku optical cable observation system Masanao Shinohara <sup>1</sup> , Hiroki Takano <sup>2</sup> , Tomoaki Yamada <sup>1</sup> , Takeshi Akuhara <sup>1</sup> , Kimihiro Mochizuki <sup>1</sup> , Shin'ichi Sakai <sup>1</sup> <sup>1</sup> The University of Tokyo, <sup>2</sup> INPEX Corporation	2060			9:10- 9:30	8.3	Group Formation of Autonomous Underwater Vehicles that Optimizes Energetic Efficiency in Cruising Gen Li <sup>1</sup> , Lei Duan <sup>2</sup> , Ramiro Godoy-Diana <sup>3</sup> , Benjamin Thiria <sup>3</sup> <sup>1</sup> Japan Agency for Marine-Earth Science and Technology, <sup>2</sup> Shanghai Jiao Tong University, <sup>3</sup> Sorbonne Université, Université de Paris	2046	
			9:30- 9:50	7.4	Real-time tsunami damage prediction using DONET and the implementation Narumi Takahashi <sup>1</sup> , Naotaka Chikasada <sup>1</sup> , Kentaro Imai <sup>2</sup> <sup>1</sup> National Research Institute for Earth Science and Disaster Resilience, <sup>2</sup> Japan Agency for Marine-Earth Science and Technology	2093			9:30- 9:50	8.4	Development of a Basic Formation Control System for Heterogeneous Autonomous Marine Vehicles and its Sea Trials in Suruga Bay Akihiro Okamoto <sup>1</sup> , Kangsoo Kim <sup>1</sup> , Masahiko Sasano <sup>1</sup> , Takumi Sato <sup>1</sup> , Shogo Inaba <sup>1</sup> , Satoshi Kondo <sup>2</sup> , Hiroshi Matsumoto <sup>2</sup> , Takashi Murashima <sup>2</sup> , Takuya Shimura <sup>2</sup> , Toshifumi Fujiwara <sup>1</sup> , and Hiroyuki Osawa <sup>2</sup> <sup>1</sup> National Institute of Maritime, Port and Aviation Technology, <sup>2</sup> Japan Agency for Marine-Earth Science and Technology	2081	
			9:50- 10:10	7.5	Consideration of meteotsunami real-time forecasting method using high quality atmospheric and ocean bottom pressure records Naotaka Yamamoto Chikasada National Research Institute for Earth Science and Disaster Resilience (NIED)	2096	REMO		9:50- 10:10	8.5	Towards an Open-Source Benchmark for Underwater Object Detection and Pose Estimation, Ivar Bjørge Saksvik, Alex Alcocer, Håkon Weydahl, Håkon Teigland, Vahid Hassani Oslo Metropolitan University	2116	
			10:10- 10:30	7.6	Development and Construction of Nankai Trough Seafloor Observation Network for Earthquakes and Tsunamis: N-net Shin Aoi, Tetsuya Takeda, Takashi Kunugi, Masanao Shinohara, Takayuki Miyoshi, Kenji Uehira, Masashi Mochizuki, and Narumi Takahashi National Research Institute for Earth Science and Disaster Resilience (NIED)	2054							
	10:45- 12:00				Poster Session 2								
	12:00- 13:15				Sponsor's Luncheon Nortek Japan								
Wednes day 8 March	13:15- 14:55	Special Session: Underwater Optical Technology Chair: Yang Weng, IIS, University of Tokyo	13:15- 13:35	9.1	SquidJam: A Video Annotation Ecosystem Mehul Sangekar <sup>1</sup> , Ariell Friedman <sup>2</sup> , Mitsuko Hidaka <sup>1</sup> , Takashi Hosono <sup>1</sup> , Dhugal Lindsay <sup>1</sup> <sup>1</sup> Japan Agency for Marine-Earth Science and Technology, <sup>2</sup> Greybits Engineering	2100		Sensors Chairs: Tatsuhiko Fukuba, JAMSTEC and Miquel Massot Campos, University of Southampton	13:15- 13:35	10.1	Seabed Object's Height Estimation Method Utilizing Tilt Angle Changes of Imaging Sonar Minsung Sung, Young-woon Song, and Son-Cheol Yu Pohang University of Science and Technology	2021	
			13:35- 13:55	9.2	Advanced Submersible Imaging Technique of Digital Holography: In-situ Measurement of Marine Particles and Data Processing Zonghua Liu <sup>1,2,*</sup> , Sarah Giering <sup>2</sup> , Tomoko Takahashi <sup>3</sup> , Thangavel Thevar <sup>4</sup> , Marika Takeuchi <sup>3</sup> , Nick Burns <sup>5</sup> , Blair Thornton <sup>2,6</sup> , John Watson <sup>4</sup> , and Dhugal Lindsay <sup>3</sup> <sup>1</sup> National Oceanography Centre, <sup>2</sup> University of Tokyo, <sup>3</sup> JAMSTEC <sup>4</sup> University of Aberdeen, <sup>5</sup> Hi-Z 3D LTD, <sup>6</sup> University of Southampton	2087	REMO		13:35- 13:55	10.2	Towards sensor agnostic artificial intelligence for underwater imagery Miquel Massot-Campos <sup>1</sup> , Takaki Yamada <sup>1</sup> , Blair Thornton <sup>1,2</sup> <sup>1</sup> University of Southampton, <sup>2</sup> The University of Tokyo	2090	
			13:55- 14:15	9.3	RamaCam: autonomous in-situ monitoring system of marine particles by combining holography and Raman spectroscopy Tomoko Takahashi <sup>1,2</sup> , Zonghua Liu <sup>2,3</sup> , Thangavel Thevar <sup>4</sup> , Nicholas Burns <sup>4</sup> , Mehul Sangekar <sup>1</sup> , Dhugal Lindsay <sup>1</sup> , John Watson <sup>4</sup> , and Blair Thornton <sup>5</sup> <sup>1</sup> Japan Agency for Marine-Earth Science and Technology, <sup>2</sup> The University of Tokyo, <sup>3</sup> National Oceanography Centre Southampton, <sup>4</sup> University of Aberdeen, <sup>5</sup> University of Southampto	2065	REMO		13:55- 14:15	10.3	Application of Ambient Pressure-Driven Pumping Technology towards Tatsuhiko Fukuba <sup>1</sup> , Akira Fujiwara <sup>2</sup> , Katsuhiko Nishiguchi <sup>2</sup> , Massami Bergaud <sup>3</sup> , Simon Grall <sup>3</sup> , Shuo Li <sup>3</sup> , Soo-Hyeon Kim <sup>3</sup> , Nicolas Clément <sup>3</sup> <sup>1</sup> JAMSTEC, <sup>2</sup> NTT Corporation, <sup>3</sup> The University of Tokyo	2063	
			14:15- 14:35	9.4	Improving the Quality of Underwater Wireless Optical Communications in Uncertain Ocean Environments Yang Weng <sup>1</sup> , Takumi Matsuda <sup>2</sup> , Toshihiro Maki <sup>1</sup> <sup>1</sup> The University of Tokyo, <sup>2</sup> Meiji University	2127			14:15- 14:35	10.4	Modelling our way out of a featureless correspondence problem for automatic calibration of laser stripe mapping systems David Stanley <sup>1</sup> , Adrian Bodenmann <sup>1</sup> , Miquel Massot-Campos <sup>1</sup> , Blair Thornton <sup>1,2</sup> <sup>1</sup> University of Southampton, UK <sup>2</sup> The University of Tokyo, Japan	2122	
											14:35- 14:55	10.5	GPS-Based Hydrophone Drifter for Underwater Locator Beacon Search Chau-Chang Wang <sup>1,2</sup> , Wei-Cheng Yu <sup>1</sup> , Hsin-Hung Chen <sup>1</sup> , Po-Chi Chen <sup>2</sup> <sup>1</sup> National Sun Yat-sen University, <sup>2</sup> Taiwan Ocean Research Institute National Applied Research Lab
	15:15- 16:15	<b>Keynote 2</b>			<b>Technology for the Deep Ocean Exploration</b> Dr. G. A. Ramadass, National Institute of Ocean Technology								
	16:20- 17:20	<b>Keynote 3</b>			<b>Ocean Observations Using Autonomous Vehicles in Challenging Environments</b> Prof. Karen Heywood, University of East Anglia								
Thursd ay 9 March	8:30- 10:10	Marine Construction 1 Chairs: Tadashi Ebihara, University of Tsukuba and Tsukasa Kita, Port and Airport Research Institute	8:30- 8:50	11.1	Towards Reconstruction of 3D Geometry of Underwater Rubble Mounds via Structure from Motion Shunsuke Takao, Tsukasa Kita, Taketsugu Hirabayashi Port and Airport Research Institute	2094	REMO	Environmental Monitoring 2 Chairs: Katsunori Mizuno, University of Tokyo and Tom Akamatsu, Ocean Policy Research Institute, The Sasakawa Peace	8:30- 8:50	12.1	A Search Strategy and Vessel Detection in Maritime Environment Using Fixed-Wing UAVs Marijana Peti, Ana Milas, Natko Kraševac, Marko Križmančić, Ivan Lončar, Nikola Mišković, Stjepan Bogdan University of Zagreb	2047	
			8:50- 9:10	11.2	Prototyping of Automatic Navigation of Underwater Robot for Underwater Visual Inspection Tsuaksa Kita, Toshinari Tanaka Port and Airport Research Institute	2112			8:50- 9:10	12.2	High-resolution visual seafloor mapping and classification using long range capable AUV for ship-free benthic surveys Adrian Bodenmann <sup>1</sup> , José Cappelletto <sup>1</sup> , Miquel Massot-Campos <sup>1</sup> , Darryl Newborough <sup>2</sup> , Ed Chaney <sup>3</sup> , Rachel Marlow <sup>3</sup> , Robert Templeton <sup>3</sup> , Alexander B. Phillips <sup>3</sup> , Brian J. Bett <sup>3</sup> , Catherine Wardell <sup>3</sup> , Blair Thornton <sup>1,4</sup> <sup>1</sup> Centre for In situ and Remote Intelligent Sensing, FEPS <sup>2</sup> Sonardyne International Ltd. <sup>3</sup> University of Southampton <sup>4</sup> The University of Tokyo	2107	

			9:10-9:30	11.3	FOTOAN: A Novel Deepwater Anchoring System Keerthi Raaj S, Nilanjan Saha, Sundaravivelu R Indian Institute of Technology, Madras	2004		Foundation	9:10-9:30	12.3	Development of edge computing underwater sound recorder to monitor deep sea soundscape Masaya Katagiri <sup>1</sup> , Hiromi Kayama Watanabe <sup>2</sup> , Shinsuke Kawagucci <sup>2</sup> , Kotaro Tanaka <sup>3</sup> , Tomonari Akamatsu <sup>3</sup> <sup>1</sup> Nippon Marine Enterprises, Ltd., <sup>2</sup> Japan Agency for Marine-Earth Science and Technology, <sup>3</sup> Ocean Policy Research Institute The Sakakawa Peace Foundation	2064	
			9:30-9:50	11.4	Experimental Study of kW-class Wireless Charging System for Autonomous Underwater Vehicle with Magnetic Resonance Ryosuke Hasaba <sup>1</sup> , Shuichiro Yamaguchi <sup>2</sup> , Tatsuo Yagi <sup>2</sup> , Kazuhiro Eguchi <sup>3</sup> , Hiroshi Satoh <sup>2</sup> , Yoshio Koyanagi <sup>2</sup> , Tamaki Ura <sup>4</sup> ,  <sup>1</sup> Panasonic Industry Co., Ltd., <sup>2</sup> Panasonic System Networks R&D Lab. Co., <sup>3</sup> Panasonic Connect Co., Ltd., <sup>4</sup> Deep-ocean Ridge Technology Co., Ltd.	2098			9:30-9:50	12.4	Shallow Water Seagrass Survey at Studland Bay with the AUV Smarty200 Miquel Massot-Campos <sup>1</sup> , Takaki Yamada <sup>1</sup> , Bronwyn Walker-Rouse <sup>1</sup> , Ken Collins <sup>1</sup> , Julian Leyland <sup>1</sup> , Hachem Kassem <sup>1</sup> , Blair Thornton <sup>1, 2</sup> <sup>1</sup> University of Southampton, UK, <sup>2</sup> The University of Tokyo, Japan	2089	
			9:50-10:10	11.5	Trial Experiment of Positioning of Underwater Backhoe Using Time-of-flight of Acoustic Signal Group and Database Matching for Realization of Unmanned and Remote Underwater Construction Tohru Yoshihara <sup>1</sup> , Tadashi Ebihara <sup>2</sup> , Koichi Mizutani <sup>2</sup> <sup>1</sup> Aomi Construction Co., Ltd., <sup>2</sup> University of Tsukuba	2056			9:50-10:10	12.5	Sea Pollution: Analysis and Monitoring using Unmanned Vehicles Teresa Lourenço Antunes <sup>1</sup> , Ricardo Pinto Moura <sup>2</sup> , Nuno Pessanha Santos <sup>1</sup> , Victor Lobo <sup>1,3</sup> <sup>1</sup> Portuguese Naval Academy, <sup>2</sup> NOVA School of Science and Technology, <sup>3</sup> Universidade Nova de Lisboa	2124	REMO
Thursday 9 March	10:30-11:50	Acoustics and Communications 2 Chairs: Mitsuyasu Deguchi, JAMSTEC and Linus Chiu, National Sun Yat-sen University	10:30-10:50	13.1	Experimental demonstration of equalization with phase lock loops against Doppler shifts of multipath signals on underwater acoustic communications Mitsuyasu Deguchi, Yukihiro Kida, Takuya Shimura Japan Agency for Marine-Earth Science and Technology	2070		Marine Robotics 4 Chairs: Masanao Sumiyoshi, Japan Coast Guard and Hsin-Hung Chen, National Sun Yat-sen University	10:30-10:50	14.1	Evaluation of Optical-Flow-Based Feature Matching for Underwater Vehicle's Displacement Estimation Hsin-Hung Chen, Chao-Wei Tsai National Sun Yat-sen University	2050	
			10:50-11:10	13.2	Simplification of full spectrum soundscape analysis using specific frequencies Leo Chiu-Leung James Cook University	2083			10:50-11:10	14.2	Developments of standardization and quality control for AUV bathymetric data through sea trials of "AUV-NEXT" Masanao Sumiyoshi <sup>1</sup> , Tadahiro Hyakudome <sup>2</sup> , Yusuke Yokota <sup>3</sup> , Ryosuke Nagasawa <sup>1</sup> , Takeshi Nakatani <sup>2</sup> , Kenji Nagahashi <sup>2</sup> , Tatsuya Aso <sup>2</sup> <sup>1</sup> Japan Coast Guard, <sup>2</sup> Japan Agency for Marine-Earth Science and Technology, <sup>3</sup> The University of Tokyo Tokyo, Japan	2101	
			11:10-11:30	13.3	Correlation of dynamic internal waves with foraging activity of marine mammals in the South China Sea Linus Chiu <sup>1</sup> , Yiing Jang Yang <sup>2</sup> , Ke-Hsien Fu <sup>3</sup> <sup>1</sup> National Sun Yat-sen University, <sup>2</sup> National Taiwan University, <sup>3</sup> National Academy of Marine Research	2110			11:10-11:30	14.3	Geometric Registration of Benthic Imagery for Learning Appearance-Based Place Recognition over Multiple Sessions Martin Kvisvik Larsen <sup>1</sup> , Oscar Pizarro <sup>1,2</sup> , Martin Ludvigsen <sup>1</sup> <sup>1</sup> Norwegian University of Science and Technology Trondheim <sup>2</sup> University of Sydney	2036	
			11:30-11:50	13.4	Utilization of Several types of Bio-mimic Pulse Train for Acoustic Localization in Coastal Areas Hanako Ogasawara, Eri Sato, Shota Urakawa, Takanobu Kuroyama, Kazuyoshi Mori National Defense Academy of Japan	2111							
	11:55-12:25				Awards Ceremony								
	12:25-13:40				Sponsor's Luncheon Shoshin Corporation								
Thursday 9 March	13:40-15:00	Marine Mineral Resources Chairs: Umesh Neethiyath, University of Tokyo and Tetsuo Yamazaki, Osaka Metropolitan University	13:40-14:00	15.1	Economic Feasibility Analyses for Seafloor Massive Sulfide Mining in Okinawa Trough Area, Japan Tetsuo Yamazaki, Naoki Nakatani, Rei Arai Osaka Metropolitan University	2026		Environmental Monitoring 3 Chairs: Anja Babic, University of Zagreb and Daisuke Kitazawa, IIS, University of Tokyo	13:40-14:00	16.1	DHC sensorics of bubble methane in situ Victor Dyomin, Igor Polovtsev, Alexey Olshukov, Alexandra Davydova Tomsk State University	2053	
			14:00-14:20	15.2	An Economic Feasibility Analysis for Combined Mining of Cobalt-rich Crusts and Phosphorous Ores in North-west Pacific Tetsuo Yamazaki Osaka Metropolitan University	2027			14:00-14:20	16.2	Heterogeneous marine robotic system for environmental monitoring missions Fausto Ferreira <sup>1</sup> , Anja Babic <sup>1</sup> , Martin Orec <sup>1</sup> , Nikola Miškovic <sup>1</sup> , Corrado Motta <sup>2</sup> , Roberta Ferretti <sup>2</sup> , Angelo Odetti <sup>2</sup> , Simona Aracri <sup>2</sup> , Gabriele Bruzzone <sup>2</sup> , Massimo Caccia <sup>2</sup> , Federica Braga <sup>3</sup> , Giorgia Manfè <sup>3</sup> , Giuliano Lorenzetti <sup>3</sup> , Gianmarco Scarpa <sup>3</sup> , Francesca De Pascalis <sup>3</sup> <sup>1</sup> Laboratory for Underwater Systems and Technologies (LABUST), <sup>2</sup> National Research Council of Italy (CNR) Institute of Marine Engineering (INM), <sup>3</sup> National Research Council of Italy (CNR) Institute of Marine Science (ISMAR)	2037	
			14:20-14:40	15.3	Underwater sound observation using the Edokko Mark I as a platform of acoustic environment assessment for marine mineral resource development Yosuke Onishi <sup>1</sup> , Hajime Naganuma <sup>1</sup> , Yuya Yamamoto <sup>1</sup> , Kyohei Takami <sup>1</sup> , Mitsuru Shimazu <sup>1</sup> , Masayuki Nagao <sup>2</sup> , Naoki Saito <sup>2</sup> , Atsushi Suzuki <sup>2</sup> , Tomonari Akamatsu <sup>3</sup> <sup>1</sup> KANSO Technos CO., LTD., <sup>2</sup> National Institute of Advanced Industrial Science and Technology (AIST), <sup>3</sup> Institute of Bioacoustic Technologies	2077			14:20-14:40	16.3	A Network of Underwater Flow Sensors for Long-term Estimation of Fish Feeding Activity Dominic Solpico <sup>1</sup> , Yuya Nishida <sup>1</sup> , Kota Mishima <sup>1</sup> , Kazuo Ishii <sup>1</sup> Tokuo Suetsugu <sup>2</sup> , Yoshinori Yatsunami <sup>2</sup> <sup>1</sup> Kyushu Institute of Technology, <sup>2</sup> Belltechn Co., Ltd. Fukuoka, Japan	2041	
			14:40-15:00	15.4	Enhancing the Coverage of Underwater Robot Based Mn-crust Survey Area by Using a Multibeam Sonar Umesh Neethiyath <sup>1</sup> , Mehul Sangekar <sup>2,1</sup> , Kazunori Nagano <sup>1</sup> , Tetsu Koike <sup>1</sup> , Blair Thornton <sup>3,1</sup> , Harumi Sugimatsu <sup>1</sup> , Hikari Hino <sup>4</sup> , Akiko Suzuki <sup>4</sup> <sup>1</sup> The University of Tokyo, <sup>2</sup> Japan Agency for Marine-Earth Science and Technology, <sup>3</sup> University of Southampton, <sup>4</sup> Japan Organization for Metals and Energy Security	2072			14:40-15:00	16.4	Numerical Analysis of the Motion of an Automated Fish Guiding System for Set Net Fishery, Daigo Furuichi, Qiao Li, Yoichi Mizukami, Shuchuang Dong Jinxin Zhou, Daisuke Kitazawa The University of Tokyo	2126	
Thursday 9 March	15:20-16:40	Marine Robotics 5 Chairs: Hayato Kondo, Tokyo University of Marine Science	15:20-15:40	17.1	Development of Moon Jellyfish Removal ROV System and Its Sea Trial Jonghyun Ahn Hiroshima Institute of Technology	2049		Marine Construction 2 Chairs: Keisuke Takahashi, Mitsubishi UBE Cement	15:20-15:40	18.1	Utilization of cement-based materials for deep sea infrastructure Keisuke Takahashi <sup>1</sup> , Mari Kobayashi <sup>1</sup> , Takafumi Kasaya <sup>2</sup> , Yuichiro Kawabata <sup>3</sup> , Mitsuyasu Iwanami <sup>4</sup> , Toshiro Yamanaka <sup>5</sup> , Shun Nomura <sup>5</sup> , Hiroko Makita <sup>1</sup> Mitsubishi UBE Cement Corporation, <sup>2</sup> Japan Agency for Marine-Earth Science and Technology, <sup>3</sup> National Institute of Maritime, Port and Aviation Technology Port and Airport Research Institute, <sup>4</sup> Tokyo Institute of Technology, <sup>5</sup> Tokyo University of Marine Science and Technology	2071	

	and technology and Eiichiro Araki, JAMSTEC	15:40- 16:00	17.2	Development of the Autonomous Core Sampling System for AUV Shogo Inoue <sup>1</sup> , Sotaro Takashima <sup>1</sup> , Kazunori Nagano <sup>2</sup> Kotohiro Masuda <sup>1</sup> , Satoru Taoka <sup>1</sup> , Blair Thornton <sup>2</sup> , Harumi Sugimatsu <sup>2</sup> , Yuya Nishida <sup>3</sup> , Isao Koike <sup>1</sup> , Tamaki Ura <sup>4</sup> <sup>1</sup> IDEA Consultants, Inc., <sup>2</sup> TheUniversity of Tokyo, <sup>3</sup> Kyushu Institute of Technology, <sup>4</sup> Deep-ocean Ridge Technology Co., Ltd	2104		Corporation and Muneo Yoshie, National Institute of MarinePort and Aviation Technology (PARI)	15:40- 16:00	18.2	Essential resource management in dredging hydrographic surveying using USV and SV Pawel Pocwiardowski NORBIT US LTD	2084	
		16:00- 16:20	17.3	Development of a Hybrid Underwater Vehicle for Visual Inspection of Bridge Piers Hayato Kondo <sup>1</sup> , Shukichi Kobayashi <sup>1</sup> , Takatsugu Tashiro <sup>1</sup> , Noriaki Saigo <sup>2</sup> , Toshifumi Hiraike <sup>2</sup> , Kai Kuroki <sup>2</sup> <sup>1</sup> Tokyo University of Marine Science and Technology, <sup>2</sup> Trans-Tokyo Bay Highway Corporation	2121			16:00- 16:20	18.3	Efficient real-time dredging monitoring Pawel Pocwiardowski NORBIT US LTD	2085	
								16:20- 16:40	18.4	Forecasting Underwater Positioning Base and Station for Coastal Construction and Inspection Muneo Yoshie, Tomoo Sato Port and Airport Research Institute National Institute of Maritime, Port and Aviation Technology	2099	
16:45- 17:00				Closing Ceremony								