CSI XLIII & ASLIBS2023

Colloquium Spectroscopicum Internationale XLIII

The 5th Asian Symposium on Laser Induced Breakdown Spectroscopy

Date: June 26-30, 2023

Venue: AWAGIN HALL

Tokushima, JAPAN

CSI XLIII & ASLIBS2023

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COLLOQUIUM SPECTROSCOPICUM INTERNATIONALE XLIII & THE 5TH ASIAN SYMPOSIUM ON LASER INDUCED BREAKDOWN SPECTROSCOPY

Program at a glance

CSI XLIII/ASLIBS2023
Program at a glance (tentative)

time (Japan)	26-Jun	27-Jun	28-Jun	29-Jun	30-Jun
9:20		P-3: Mohamad Sabsabi	P-5: Jozef Kaiser	CSI Award	Excursion
9:50		P-4: Alexander A. Kamnev	P-6: Erico Flores	ACLIBS Award	
10:20		Coffee Break & Discussion (30 minutes)	Coffee Break & Discussion (30 minutes)	Coffee Break & Discussion (30 minutes)	
10:50		CSI: Mössbauer Spectroscopy and NMR (55 minutes): CI-5: Jun Okabayashi; CI-6: Shiro Kubuki; CO-3: Nur Syahirah Kamal Bahrain CSI: Instrumentation1 (60 minutes): CI-7: Jan Kratzer; CI-8: Takae Takeuchi; CI-9: Tadao Tanabe LIBS: Advanced Techniques (100 minutes): AI-4: Yoshihiro Deguchi; AI-5: Ayumu Matsumoto; AO-4: Zhang Mengyang; AO-5: Joey Kim Sodiano; AO-6: Mengyu Bao; AO-7: Minchao Cui	CSI: LIBS (105 minutes): CI-14: Pavel Pořízka; CI-15: Vincenzo Palleschi; CI-16: José Miguel Vadillo Pérez; CO-6: Meirong Dong; CO-7: Yoshihiro Deguchi; CO-8: Wei Wang LIBS: Instrumentation and Space Applications (110 minutes): AI-8: Jin Yu; AI-9: Shu Rong; AO-12: Zixiong Qin; AI-10: Yuichiro Cho; AI-11: Ronger Zheng; AO-13: Dacheng Zhang	CSI: X-ray Spectrometry/Nuclear Techniques (110 minutes): CI-21: Sofia Pessanha; CI-22: Takashi Yamamoto; CI-23: Maria Luisa Carvalho; CI-24: Kozo Shinoda; CO-12: Yasuki Okuno; CO-13: Chihiro Iwamoto LIBS: Industry Applications (125 minutes): AI-15: Sungho Jeong; AO-17: Wangquan Ye; AI-16: Shunsuke Kashiwakura; AO-18: Mingxi Shi; AI-17: Lanxiang Sun; AI-18: Shunchun Yao; AO-19: Cong Li	
12:50	Registration	Lunch & Discussion (~14:00)	Lunch & Discussion (~14:00)	Lunch & Discussion (~14:00)	
14:00	Opening Ceremony (30 minutes)	CSI: Instrumentation2 (70 minutes): CI-10: Stanislav Musil; CI-11: Ryo Kato; CO-4: Yoko Nunome; CO-5: Fiorella Iaquinta CSI: Optical Spectroscopy (55 minutes): CI-12: Hitoshi Mizuguchi; CI-13: Susumu Imashuku; CO-17: Hermicenda Pérez Vidal LIBS Basics (85 minutes): AI-6: Zhenzhen Wang; AO-8: Jens Riedel; AO-9: Kota Tanabe; AO-10: Ye Tian; AI-7: Davide Bleiner	CSI: ICP/MS (125 minutes): CI-17: Ming Xu; CI-18: Atitaya Siripinyanond; CI-19: Ignacio Machado; CI-20: Naoki Noguchi; CO-9: Beatrice Campanella; CO-10: RalfZimmermann; CO-11: Luhail Makman LIBS: Environmental and Bio-Applications (105 minutes): AI-12: Javier Laserna; AI-13: Duixiong Sun; AI-14: Lianbo Guo; AO-14: Jeong Wook Um; AO-15: Fei Ma; AO-16: Francesco Poggialini	P-7: Qiuquan Wang P-8: Hongbin Ding CSI: Other Spectroscopic Method (50 minutes): CI-25: Shinsuke Kanimura; CO-14: Changwen Du; CO-15: Ruidong Jia CSI: Liquid Solution Measurement (50 minutes): CI-26: Masahito Uchikoshi; CO-16: Li Meng LIBS: Nuclear Applications (95 minutes): AO-20: Hai Ran; AO-21: Pavel Veis; AO-22: Yan Qiu; AI-19: Hironori Ohba; AO-23: Munkhbat Batsaikhan; AO-24: Zhixing Gao	
15:00	P-1: Alessandro De Giacomo				
15:30	P-2: Bao Wakaida				
16:00	Coffee Break & Discussion (30 minutes)	Coffee Break & Discussion (~16:30)	Coffee Break & Discussion (~16:30)	Closing Ceremony (30 minutes)	
16:30	CSI: Environmental Analysis (50 minutes): CI-1: Ralf Zimmermann; CO-1: Alexander A. Kamnev; CO-2: Daisuke Itahashi CSI: IR/Raman (60 minutes): CI-2: Anna V. Tugarova; CI-3: Boris Mizaikoff; CI-4: Taka-aki Yano LIBS: Data Analysis (105 minutes): AI-1: Zhe Wang; AI-2: Yonghoon Lee; AI-3: Igor Gornushkin; AO-1: Weilun Gu; AO-2: Boyang Xue; AO-3: Feiyu Guan	Poster Session 1 Tuesday 27th 9:20-18:30 Intensive Discussion : 16:30-18:30	Poster Session 2 Tuesday 28th 9:20-18:30 Intensive Discussion : 16:30-18:30		
17:00					
17:30					
18:30					
19:00					
19:30				Banquet (120 minutes) Closing Ceremony	
20:00	Welcome party (120 minutes)	Student and Young Researcher Meeting (120 minutes)			
21:00					
21:30					

CSI ISC meeting

ASLIBS ISC meeting

Chairpersons

Yoshihiro Deguchi,
***Tokushima University*, Japan**

Susumu Imashuku,
***Tohoku University*, Japan**

Dear Colleagues and Friends,

On behalf of the organizing committee, we are pleased to announce that **Colloquium Spectroscopicum Internationale XLIII** (CSI XLIII) will be held in Tokushima, Japan, from June 26 to 30, 2023.

CSI has a long history since it was first held in Strasbourg, France in 1950, and CSI XLIII will be held in Japan for the first time in 42 years, since the 47th in Tokyo in 1981. This year's conference will be a joint conference with ASLIBS2023. Attending CSI XLIII will be a great opportunity to meet your spectroscopic colleagues from all over the world. Don't miss this opportunity!

We sincerely welcome all Spectroscopic researchers and students to join us. We look forward to seeing you in Tokushima.

Prof. Yoshihiro Deguchi
Tokushima University

Assoc. Prof. Susumu Imashuku
Tohoku University

Chairperson

***Tetsuo Sakka*, Kyoto University, Japan**

Dear Colleagues and Friends,

On behalf of the organizing committee, I am pleased to announce that the 5th Asian Symposium on Laser Induced Breakdown Spectroscopy (ASLIBS) will be held in Tokushima, Japan, from June 26 to 30, 2023.

Previous ASLIBS symposia have been held in Wuhan (China), Tokushima (Japan), Jeju (Korea), and Qingdao (China). The 2023 symposium is the second to be held in Tokushima. This year's symposium will be a joint symposium with CSI 2023. Attending the symposium will be a great opportunity to meet not only your LIBS colleagues in Asia, but also analytical spectroscopists from all over the world. Don't miss this opportunity!

We sincerely welcome all LIBS researchers and students to join us. We look forward to seeing you in Tokushima.

T. Sakka

Prof. Tetsuo Sakka
Kyoto University

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Program - Oral -

Plenary Presentation (P-1~8) : 30 min. Invited Presentation (CI-1~26: CSI, AI-1~19: ASLIBS) : 20 min. Oral Presentation (CO-1~17: CSI, AO-1~24: ASLIBS) : 15 min.		
Monday 26th Afternoon		
Plenary Presentation, ROOM-A		
P-1	Alessandro De Giacomo, Aya Taleb, Marcella Dell'Aglio, Rosalba Gaudiuso	Laser Induced Breakdown Spectroscopy: from on-flight applications to ultra trace analysis
P-2	Ikuo Wakaida, Hironori Ohba, Katsuaki Akaoka, Takahiro Karino, Ryuzo Nakanishi, Kan Sakamoto, Yuji Ikeda, Takunori Taira	LIBS for "Fukushima"; Current results and challenge as a remote in-situ screening analysis
CSI: Environmental Analysis, IR/Raman, ROOM-A		
CI-1	Ralf Zimmermann, Hendryk Czech, Kevin Schnepel, Marco Schmidt, Patrick Martens, Thorsten Streibel, Judy Chow, John Watson, Andreas Walte, Sven Ehlert	A new approach for unravelling the molecular organic signature of atmospheric aerosol particles: Coupling of a thermal-optical carbon analyser (TOCA) to combined laser photo-ionization and electron ionisation mass spectrometry
CO-1	Alexander A. Kamnev, Yulia A. Dyatlova, Odissey A. Kenzhegulov, Anna V. Tugarova	FTIR spectroscopic investigations of biofilms formed by the rhizobacterium Azospirillum baldaniorum: methodology, matrix composition and effects of metal ions
CO-2	Daisuke Itabashi, Kazumi Mizukami, Shunsuke Taniguchi, Masayuki Nishifuji, Hidehiro Kamiya	Highly sensitive analysis for carbide nanoparticle in steels using asymmetric flow field-flow fractionation hyphenated inductively coupled plasma-mass spectrometry
CI-2	Anna V. Tugarova	Vibrational spectroscopy techniques in studying the transformation of selenium compounds by bacteria
CI-3	Boris Mizaikoff	Infrared Spectroscopy in Food Safety: Can Photonics Hunt a Cereal Killer?
CI-4	Taka-aki Yano	Plasmon-enhanced nano-spectroscopies for highly sensitive molecular detection
ASLIBS: Data Analysis, ROOM-B		
AI-1	Zhe Wang, Zongyu Hou, Weiran Song	The last mile for accurate LIBS quantification
AI-2	Yonghoon Lee	Strategy in Classical Modeling and Data Fusion with LIBS Spectra and Others for Material Classification
AI-3	I. Gornushkin	Improved Data Processing for Accurate Plasma Diagnostics with Implications for Calibration-Free LIBS
AO-1	Weilun Gu, Naoya Nishi, Zongyu Hou, Zhe Wang, Tetsuo Sakka	Investigation of the signal uncertainty for laser-induced breakdown spectroscopy based on error propagation considering self-absorption
AO-2	Boyang Xue, Yi You, Zhangjun Wang, Chao Chen, Jens Riedal	High Repetition-Rate Laser-induced Breakdown Spectroscopy Combined with Two-dimensional Correlation Method for Analysis of Sea-salt Aerosols
AO-3	Feiyu Guan, Xuechen Niu, Deng Zhang, Lianbo Guo	Delving into self-supervised plasma image-spectrum fusion for improving quantitative accuracy and precision in laser-induced breakdown spectroscopy

Tuesday 27th Morning		
Plenary Presentation, ROOM-A		
P-3	M. Sabsabi, P. Bouchard, A. Harhira, J. El Haddad, E. Soares de Lima Filho, F. Vanier, D. Gagnon	Emerging Approaches in Laser-Induced Breakdown Spectroscopy: Challenges and Perspectives
P-4	Alexander A. Kamnev	Mössbauer spectroscopy within the arsenal of molecular spectroscopic techniques: applications of Mössbauer and vibrational spectroscopies in microbiology
CSI: Mössbauer Spectroscopy and NMR, Instrumentation 1, ROOM-A		
CI-5	Jun Okabayashi	Operando x-ray and g-ray magnetic spectroscopies in the multiferroic system
CI-6	A. S. Ali, I. Khan, B. Zang, Z. Homonnay, E. Kuzmann, S. Krehula, M. Marcius, L. Pavić, A. Šantić, S. Kubuki	Highly covalent FeIII-O bond found in iron oxide nanoparticles of domestic waste molten slag characterized by 57Fe-Mössbauer spectroscopy
CO-3	Nur Syahirah Kamal Baharin, Yoshinobu Ikeda, Ken Moizumi, Tamio Ida	Chemical Structure Characterization of Spirulina Algae Bio-Coke via 13C CPMAS NMR
CI-7	Jan Kratzer, Milan Svoboda, Nikol Vlčková, Alexandra Slota, Matěj Plecháč,Tomáš Matoušek, Martina Mrkvičková, Pavel Dvořák, Jiří D ědina	Plasma discharges for trace element analysis - from their development to applications and mechanistic studies
CI-8	Takae Takeuchi	Development of ambient ion mobility spectrometers for on-site analysis of microbial volatile metabolites of soil-derived fungi in cultural property environments, and exhaled air
CI-9	Tadao Tanabe	Development of Frequency-Tunable sub-Terahertz Measurement System and its Applications for Non-Destructive Evaluation
ASLIBS: Advanced Techniques, ROOM-B		
AI-4	Yoshihiro Deguchi, Zhenzhen Wang, Zixiong Qin	Elemental analysis of molten steel using long and short double-pulse LIBS
AI-5	Ayumu Matsumoto, Yusuke Shimazu, Haruka Nakano, Kosuke Suzuki, Shinji Yae	Surface-enhanced LIBS using a porous silicon substrate —Analysis of microdroplets with different salinity—
AO-4	Zhang Mengyang, Fu Hongbo, Wang Huadong, Zhang Zhirong	Improve LIBS signal stability and analysis accuracy by optimizing plasma excitation and acquisition scheme
AO-5	Joey Kim Soriano, Yuji Ikeda	LOD extension by multi-fiber integration in microwaved-enhanced LIBS
AO-6	Mengyu Bao, Qianqian Wang, Geer Teng, Xiangjun Xu, Zhifang Zhao, Kai Wei, Tianzhong Luo, Yongyue Zheng, Bingheng Lu	Reshape the laser phase to improve the LIBS spectrum signal based on orbital angular momentum
AO-7	Minchao Cui, Dinghua Zhang, Yoshihiro Deguchi, Zhenzhen Wang	Laser induced Breakdown Spectroscopy (LIBS): A piercing eye for manufacturing process
Tuesday 27th Afternoon		
CSI: Instrumentation 2, Optical Spectroscopy, ROOM-A		
CI-10	Stanislav Musil, Eva Jeníková, Jaromír Vyhnanovský	Expansion of photochemical vapor generation to ultratrace determination of technology-critical elements
CI-11	Ryo Kato, Taka-aki Yano, Takuo Tanaka	Mid-infrared photothermal spectroscopy and imaging for biochemical analysis
CO-4	Yoko Nunome, Kenji Kodama, Kazuaki Wagatsuma	Glow discharge plasma ionization mass spectrometry for rapid analysis of oxygenated volatile organic compounds
CO-5	Fiorella Iaquinta, Alicia Mollo	Advances in mercury chemical speciation in fish by CV-MIP OES after ultrasound alkaline extraction
CI-12	Hitoshi Mizuguchi, Daichi Tanaka, Yusuke Taniguchi, Suherman Suherman, Toshio Takayanagi, Yasutada Suzuki	Highly sensitive determination of copper by solid-phase colorimetry using a reflection colorimeter integrated with a coaxial optical fiber cable
CI-13	Susumu Imashuku	Enhancement of cathodoluminescence intensity for identification of monazite and xenotime in mineral ores
CO-17	Hermicenda Pérez Vidal, M. Antonia Lunagómeez Rocha, Ciro Marquez Herrera, Dayli G.Romero de la Cruz	METALS IN PARTICULATE MATERIAL FILTERS (PM10) IN TABASCO, MEXICO
ASLIBS: LIBS Basics, ROOM-B		
AI-6	Zhenzhen Wang, Sijie Shen, Jiabao Lai, Wangzheng Zhou, Junjie Yan, Deguchi Yoshihiro	Spectral Analysis of Alkali Metal by Laser-Induced Breakdown Spectroscopy
AO-8	Jens Riedel, Yi You	Influence of laser pulse length and repetition rate on the molecular/atomic band contribution in solid target LIBS
AO-9	Kota Tanabe, Yuko Yokoyama, Naoya Nishi, Tetsuo Sakka	Relationship between self-absorption and irradiation conditions in underwater LIBS
AO-10	Ye Tian, Ziwen Jia, Ying Li, Yuan Lu, Jinjia Guo, Wangquan Ye, Ronger Zheng	Dynamics of laser-induced plasma and cavitation bubble in water at high pressures
AI-7	Davide Bleiner, Di Qu, Kevin Kraft, Mirushe Suloska, Adrian Wichser	Laser Induced XUV Spectrometry (LIXS): Even Better Than the Real LIBS

Wednesday 28th Morning		
Plenary Presentation, ROOM-A		
P-5	Jozef Kaiser, Karolína Vytisková, Pavlína Modlitbová, Karel Novotný, Petr Skládal, Zdeněk Farka, Pavel Pořízka	Laser-Induced Breakdown Spectroscopy as a promising tool for immunochemistry
P-6	Érico M. M. Flores	Modern Sample Preparation Methods for the Determination of "Difficult" Elements by ICP-based Techniques
CSI: LIBS, ROOM-A		
CI-14	Pavel Pořízka, Erik Képeš, Jakub Vrábel, Jakub Buday, Jozef Kaiser	Transfer learning for space applications of Laser-Induced Breakdown Spectroscopy
CI-15	Vincenzo Palleschi, Francesco Poggialini, Beatrice Campanella, Bruno Cocciaro, Giulia Lorenzetti, Simona Raneri, Stefano Legnaioli	The new IUPAC formula for the Limit of Detection: beyond the 3s/slope definition
CI-16	J. M. Vadillo, J. Moros, A. Marzo, J.J. Laserna	Laser-induced breakdown spectroscopy of samples of astrochemical interest as individual particles by means of non-inertial acoustic confinement
CO-6	Meirong Dong, Junbin Cai, Gangfu Rao, Jidong Lu	Application of multi-spectral analysis techniques in thermal conversion of fuels
CO-7	Yoshihiro Deguchi, Takahiro Kamimoto, Ruidong Jia, Zhenzhen Wang, Jiazhong Zhang	Integration of laser diagnostics and CFD toward DX for industrial processes
CO-8	Wei Wang, Tingting Shen, Fei Liu, Hang Xiao	Rapid detection method of rice root phenotype based on spectroscopic technology
ASLIBS: Instrumentation and Space Applications, ROOM-B		
AI-8	Jin Yu, Yu-Yan Sara Zhao, Chen Sun, Yunfei Rao, Fengye Chen, Tianyang Sun, Beiyi Zhang	In-situ LIBS measurements in Utopia Planitia Mars by the Zhurong Rover
AI-9	Shu Rong, Xu Weiming, Li Luning, Liu Xiangfeng, Xu Xuesen	LIBS Detection and Analysis by MarSCoDe on Zhurong Rover
AO-12	Zixiong Qin, Yoshihiro Deguchi	Real-time analysis of steel by Laser Induced Breakdown Spectroscopy based on Full-spectrum Micro Spectrometer
AI-10	Yuichiro Cho	Laser-induced breakdown spectroscopy for planetary exploration
AI-11	Beibei Wang, Ye Tian, Wenhua Song, Yuan Lu, Wangyuan Ye, Ying Li, Jijia Guo, Ronger Zheng	Laser induced plasma acoustics (LIPAc) signal in water and its potential applications
AO-13	Dacheng ZHANG, Zhongqi FENG, Yulu BA, Kewei SHEN, Zixu ZHANG, Minghao YU, Jiajia HOU, Yi ZHANG	Improving the sensitivity and resolution of LIBS by laser technology
Wednesday 28th Afternoon		
CSI: ICP/MS, ROOM-A		
CI-17	Ming Xu, Lining Xu, Xudong Wang	Integration of LA-ICP-MS and hyperspectral imaging to study the in vivo fate of noble metal nanoparticles
CI-18	Atitaya Siripinyanond, Khusnul Ilmiah, Jaturapoot Phanwichean, Nareerat Heetpat, Luluil Maknun, Jitapa Sumranjit, Rattaporn Saenmuangchin	Using field-flow fractionation and inductively coupled plasma mass spectrometry for tracking nanoparticles during their synthesis: Implications for colorimetric sensing of metal ions
CI-19	Joaquín Barbeito, Fiorella Iaquinta, Ignacio Machado	Evaluation of in vitro bioaccessibility of Cu, Fe, Mn, and Zn from cooked Uruguayan pink shrimp by microwave induced plasma atomic emission spectrometry
CI-20	Naoki Noguchi, Kouta Hiranuma, Yutaka Fujii, Takuya Yonezawa, Taka-aki Yano, Hidekazu Okamura	Measurements of diffusion coefficients in solids at high pressures by vibrational spectroscopy and diamond anvil cell
CO-9	Cosimo Malvestio, Massimo Onor, Emilia Bramanti, Enea Pagliano, Beatrice Campanella	Aqueous derivatization by ethyloxonium salts extended to the analysis of methionine and selenomethione in foods
CO-10	Ralf Zimmermann, Johnnes Passig, Julian Schade, Thomas Adam, Iva Rosenbach, Marco Schmidt, Robert Irsig, Andreas Walte, Sven Ehlert	On-line single particle mass spectrometry with multiplexed laser ionisation: Simultaneous detection of health-relevant polycyclic aromatic hydrocarbons, soot and metals from individual airborne aerosol particles
CO-11	Luluil Maknun, Atitaya Siripinyanond, Jitapa Sumranjit, Ryszard Lobinski, Joanna Szpunar	Use of inductively coupled plasma mass spectrometry and flow field-flow fractionation for understanding the sensing mechanism of bimetallic nanoparticles based aggregation probes for heavy metal ion
ASLIBS: Environmental and Bio-Applications , ROOM-B		
AI-12	J. J. Laserna, L. García-Gomez, T. Delgado, L. M. Cabalín, F. J. Fortes	Detection of indigenous organic matter in rocks from the interpretation of carbon molecular forms in the laser-induced plasma
AI-13	Duixiong Sun, Yaopeng Yin, Guoding Zhang, Maogen Su, Chenzhong Dong, Bomin Su	Applications of LIBS on Dunhuang Murals at Mogao Grottoes
AI-14	Lianbo Guo, Yanwu Chu, Weiliang Wang, Shengqun Shi	Application of Laser-induced Breakdown Spectroscopy in Biomedical Detection
AO-14	Jeong Wook Um, Suna Jin, Sook Jung Yun, Sungho Jeong	Classification of human melanoma and normal tissue using laser-induced breakdown spectroscopy
AO-15	Fei Ma, Changwen Du, Xuebin Xu, Jianmin Zhou	LIBS and FTIR–ATR spectroscopy studies of mineral–organic associations in saline soil
AO-16	Francesco Poggialini, Silvia Santini, Beatrice Campanella, Giulia Lorenzetti, Stefano Legnaioli, Vincenzo Palleschi	LIBS as an Early-Warning Technique for Heavy Metals in Water: Simple and Effective Graphene TFME Supports for Portable LIBS and NELIBS

Thursday 29th Morning		
Award Presentation, ROOM-A		
CSI	Alessandro D'Ulivo	CSI XLII AWARD Presentation
ASLIBS	Zhe Wang	ACLIBS 2023 AWARD Presentation
CSI: X-ray Spectrometry/Nuclear Techniques, ROOM-A		
CI-21	Sofia Pessanha, João Silva, Jorge Machado, Sara Pandolfi, Fernanda Silva, Eva Margui, António A. Dias, Sofia Barbosa, Diogo Pais, Diogo Casal, José Paulo Santos, Maria Luisa Carvalho, Ana Félix,	ADVANCES AND LIMITATIONS IN THE ANALYSIS OF BIOLOGICAL TISSUES USING EDXRF – OVERCOMING FORMALIN FIXATION AND PARAFFIN EMBEDDING CONSTRAINTS
CI-22	Takashi Yamamoto, Tazunori Miyamoto	XAFS study of thermal decomposition behaviour of platinum salt on catalyst support by laboratory-type spectrometer
CI-23	M.L.Carvalho, Sofia Pessanha, A. Buzanich	Elemental mapping on cultural heritage artifacts using X-ray micro beam systems
CI-24	Kozo Shinoda	Fluorescence-Yield XAS measurements of complex lanthanide compounds using laboratory XAS instrument
CO-12	Yasuki Okuno, Tomohiro Kobayashi, Mitsuru Imaizumi, Nobuhiro Sato, Yoshie Otake	Gamma-ray energy separation of solar cell dosimeter for debris survey
CO-13	Chihiro Iwamoto, Ryo Kurihara, Masato Takamura, Susumu Takahashi, Kosuke Suzuki, Pingguang Xu, Yoshie Otake	Development of time-of-flight neutron diffraction technique based on compact neutron source for realizing the stress measurement of steel materials
ASLIBS: Industry Applications, ROOM-B		
AI-15	Sungho Jeong, Jaepil Lee, Sungho Shin, Minjae Cho, Kyi-Hwan Park, Ekta Srivastava, Euiseok Hwang	Development of an automatic metal scrap sorting system based on laser induced breakdown spectroscopy
AO-17	Wangquan Ye, Cheng Meng, Yu Chen, Qixian Hou, Ping Qin, Yuan Lu, Zengfeng Du, Xin Zhang, Ronger Zheng	Large-array Dynamic Scanning System for LIBS-Raman Analysis of Marine Mineral Resources Samples
AI-16	Shunsuke Kashiwakura	Evaluation of quality of classified metal scraps by the combination of laser-induced breakdown spectroscopy and machine learning
AO-18	Mingxin Shi, Jian Wu, Di Wu, Xinyu Guo, Yan Qiu, Jinghui Li, Hao Sun, Ying Zhou, Xingwen Li	The analysis of multi-elemental compositions and organic matter using laser-induced breakdown spectroscopy
AI-17	Lanxiang Sun, Yong Xin, Yang Li, Zhibo Cong	Application of LIBS to in situ analysis of molten metal
AI-18	Shunchun Yao, Ziyu Yu, Weizhe Ma	Optimizing coal property analysis via LIBS-NIRS data fusion
AO-19	Cong Li, Huace Wu, Zhenhua Hu, Zhonglin He, Longfei Li, Ran Hai, Ding Wu, Fang Ding, Rui Ding, Liang Wang, Jiansheng Hu, Junlin Chen, Guang-nan Luo, Hongbin Ding, the EAST team	Endoscope LIBS for in situ wall elemental diagnosis in EAST tokamak
Thursday 29th Afternoon		
Plenary Presentation, ROOM-A		
P-7	Qiuquan Wang, Yang Zhou, Zhen Liu, Zhengxian Lv, Xingrui Song, Yong Liang, Xiaowen Yan, Limin Yang	Single-cell Analysis Using ICP-qMS: Possibilities and Limitations
P-8	Hongbin Ding	Advance of LIBS applications in nuclear fusion research
CSI: Other Spectroscopic Method,Liquid Solution Measurement, ROOM-A		
CI-25	Shinsuke Kunimura, Naoya Kida, Kazuki Ii	Gold nanoparticles produced by low-temperature heating of the dry residue of a droplet of a solution of HAuCl4 in air
CO-14	Changwen Du, Jianmin Zhou	Release profile predictions of coated controlled release fertilizer using photoacoustic spectroscopy coupled with least squares support vector machines
CO-15	Ruidong Jia, Yoshihiro Deguchi, Jiazhong Zhang	Predictive imaging of flow fields under variable geometry conditions
CI-26	Masahito Uchikoshi, Takatoshi Matsumoto, Kozo Shinoda	Structure Analysis of Cupric Aqua and Chloro Complexes in Aqueous Chloride Solutions using X-ray Absorption Spectroscopy and ab initio calculations
CO-16	Meng Li, Zhihao Zhang, Tong Yang, Zixi Zang, Ning Li, Ronger Zheng, Jinjia Guo	Ultrafast Response Sensor Based on TDLAS for In Situ Oceanic Carbon Dioxide Detection
ASLIBS: Nuclear Applications, ROOM-B		
AO-20	Hai Ran, Bai Xue, He Zhonglin, Wu Ding, Li Cong, Ding Hongbin	One-point calibration laser-induced breakdown spectroscopy for the quantitative analysis of EAST-like plasma-facing materials
AO-21	P. Veis, W. Khan, S. Atikukke, M. Veis, S.J. Shetty, P. Dvořák	Strategies to Improve Depth LIBS Analysis for Material Migration and Fuel Retention in Fusion Related Samples – Use of Resonant LIBS and comparison ps/ns regime
AO-22	Yan Qiu, Mingxin Shi, Jian Wu, Ying Zhou, Jinghui Li, Hao Sun, Xinyu Guo, Di Wu, Xingwen Li, Yongdong Li	Laser-induced breakdown spectroscopy for measurement of key characteristics/aggressive elements of structural materials in nuclear power plants
AI-19	Hironori Ohba, Katsuaki Akaoka, Takahiro Karino, Ikuo Wakaida, Koji Tamura, Ryuzo Nakanishi, Kan Sakamoto, Takunori Taira	Fiber-coupled LIBS analysis using a microchip laser in a harsh environment
AO-23	Munkhbat Batsaikhan, Hironori Ohba, Ikou Wakaida	A laser-acoustic technique for simultaneous measurement of elemental and surface imaging of fuel debris
AO-24	Zhixing Gao, Hongyu He, Yun He, Fengming Hu Jing, Li, Zhao Wang, Shaozhe Zhang, Bing Guo	Application of Laser-Induced-Plasma spectroscopy for Nuclear Safety at CIAE

Program - Poster -

Poster Session 1 (CP-01~16:CSI, AP-01~21, 45: ASLIBS) : Tuesday 27th 9:20-18:30 Poster Session 2 (CP-17~31:CSI, AP-22~44: ASLIBS) : Wednesday 28th 9:20-18:30 Intensive Discussion : 16:30-18:30 Poster Board : W0.9m×H1.8m		
Tuesday 27th		
CP-1	Shigeru Suzuki, Michihisa Fukumoto, Kano Nakajima, Susumu Imashuku	Analysis of Structural Isomers of Alumina Formed by Oxidation of Fe–Cr–Al Alloys
CP-2	Vanessa Antunes, Sara Valadas, Miriam Pressato, António Candeias, José Mirão, Ana Cardoso, Maria L. Carvalho, Sofia Pessanha	The Evolution of Still Lifes in Earth Materials: From Baltazar Gomes Figueira to Josefa d'Óbidos
CP-3 [ST]	Ioana Maria Cortea, Luminița Ghervase, Monica Dinu, Ovidiu Țentea	Detectability of ancient organic compounds in various archaeological artefacts via combined non- and minimally-invasive mobile spectroscopic techniques
CP-4 [ST]	Ioana Maria Cortea, Alecsandru Chiroșca, Laurențiu Angheluță	INFRA-ART: An open-access integrated spectral library of art related materials for enhanced accessibility in cultural heritage science
CP-5	Yuhei Yamamoto, Shun-ichi Tokoro, Ryosuke Murase, Ryoichi Nakada, Kazuya Nagaishi, Shoji Imai	Application of MC-ICP-MS with solid extraction method using chelate column for trace lead isotopes in wet depositions
CP-6 [ST]	Chihiro Akiba, Manae Yamasaki, Yunhao Hu, Shinsuke Kunimura	Gold nanostructures produced by low-temperature heating of the dry residue of a droplet of a solution of HAuCl4 for surface-enhanced Raman scattering analysis
CP-7	Yasuji Muramatsu, Yoshito Kashitani, Arisa Une	Characterization of melem (2,5,8-triamino-heptazine) by soft X-ray absorption/emission spectroscopies and theoretical analysis
CP-8	Milan Svoboda, Stanislav Musil, Jan Kratzer	In-atomizer trapping of cadmium and selenium in novel designs of dielectric brrier discharge plasma atomizers
CP-9	George A. Pitsevich, Alex E. Malevich, Alexander A. Kamnev	How symmetry helps to improve the estimation of the hyperfine splitting of vibrational levels due to tunneling. The case of the HSOSH and HOSOH molecules
CP-10 [ST]	Ikuya Shimogaki, Yasuji Muramatsu	In-situ XANES measurements of thermal denaturation of proteins in eggs
CP-11 [ST]	Rihoko Miyazaki, Yuya Akahane, Shinsuke Kunimura	Total reflection X-ray fluorescence analysis of the dry residue of a large volume droplet of a water sample
CP-12 [ST]	Atitiaya Suratsawadee, Atitaya Siripinyanond, Jitapa Samranjit	Use of SP-ICP-MS for the study of parameters affecting sensing performance of gold nanoparticles as colorimetric sensor for lead detection
CP-13	Susumu Imashuku	In situ determination of the compositions of Ni–Cu film during sputtering process
CP-14 [ST]	Yuki Tada, Yoshihiro Deguchi,Takahiro Kamimoto	Research on high-sensitivity NH3 measurement technique using CT Tunable diode laser absorption spectroscopy
CP-15	Ciro Eliseo Márquez Herrera, Reina Elizabeth Haro Torralba, Ana Larissa Barbosa Sánchez, Leticia Hernández Cadena, Octavio Gamaliel Aztatzi Aguilar, Ma. de Lourdes Guadalupe Flores Luna, Martha Patricia Sierra Vargas, Consuelo Escamilla Núnez	Trace elements analysis in pleural fluid from patients in Meexico city using ICPMS
CP-16 [ST]	Yushi Yoshioka, Daichi Takagoshi, Harunobu Takeda, Hiroaki Yoshioka and Yuji Oki	Anisotropic scattering properties of micro-/nano-foamed PDMS

AP-1	Yuanchao Liu, Muhammad Shezad Khan, Irfan Ahmed, Condon Lau	Insertable, scabbarded, and nano-etched silver needle biosensor for hazardous elements depth profiling using laser-induced breakdown spectroscopy
AP-2 [ST]	Jiacen Liu, Weiran Song, Weilun Gu, Zhe Wang	Long-term repeatability improvement using beam intensity distribution for laser-induced breakdown spectroscopy
AP-3 [ST]	Zhongqi Feng, Dacheng Zhang, Hanxing Ge, Yulu Ba, Jiajia Hou, Lei Zhang	The LIBS signal enhancement of multiple lines from multiple elements by femtosecond supercontinuum laser
AP-4 [ST]	Yuzhou Song, Weiran Song, Liang Li, Weilun Gu, Kaikai Kou, Muhammad Sher Afgan, Zongyu Hou, Zheng Li, Zhe Wang	Flame-assisted plasma modulation to improve the raw signal quality for laser-induced breakdown spectroscopy
AP-5	Weiliang Wang, Yuanchao Liu, Siyi Xiao, Lianbo Guo	Stable sensing platform for diagnosing electrolyte disturbance using laser-induced breakdown spectroscopy
AP-6 [ST]	XueChen Niu, Feiyu Gan, Deng Zhang, Lianbo Guo	A spectral stability correction method based on plasma image affected by laser energy fluctuation in laser-induced breakdown spectroscopy
AP-7 [ST]	Tong Chen, Lanxiang Sun	Online Fe grade monitoring of iron ore slurry by Morse wavelet transform and lightweight convolutional neural network based on LIBS
AP-8	Wenhao Yan, Jiaxin Lv, Chenwei Zhu, Qingzhou Li, Ji Chen, Lizhu Kang, Bing Lu, Xiangyou Li	A high-stability laser induced breakdown spectroscopy detection based on Bessel beam
AP-9 [ST]	Weizhe Ma, Shunchun Yao, Ziyu Yu, Qi Yang	Development of a LIBS-NIRS tandem detection system in coal analysis
AP-10 [ST]	Ziyu Yu, Shunchun Yao, Qi Yang	Study on plasma morphology variation in laser-induced breakdown spectroscopy analysis of particle flow
AP-11	Shengqun Shi, Honghua Ma, Dengzhang, Lianbo Guo	LIBS for Accurate Qualitative and Quantitative Analysis of Brown Rice Flour Adulteration
AP-12 [ST]	S. Atikukke, S.J. Shetty, W. Khan, P. Ďurina, T. Roch, P. Dvořák, E. Grigore, F. Baiasud, P. Veis	Depth Analysis of WTa-D/Mo sample by Resonant-Laser Induced Breakdown Spectroscopy
AP-13 [ST]	Hanbeom Choi, Hyang Kim, Sang-Ho Nam, Song-Hee Han, Yonghoon Lee	Collecting dry residues in the laser-produced micro-trenches on the silicon wafer for sensitive laser-induced breakdown spectroscopy analysis of bio-fluids
AP-14 [ST]	A. N. Wangeci, D. Adén, M. H. Greve, M. A. Knadel	Predicting texture and soil organic carbon in European soils using laser-induced breakdown spectroscopy
AP-15	Hanyun Li, Denghong Zhang, Hengli Qian, Weiwei Han, Duixiong Sun	Analysis of mural pigments based on LIBS and Raman technology
AP-16	Weiwei Han, Duixiong Sun, Guoding Zhang, Guanghui Dong, Maogen Su	Single-Point and Multi-Point Quantitative Analysis in Aluminum Alloy Samples Using LIBS
AP-17	Peng Zhao, Weiwei Han, Duixiong Sun, Guoding Zhang, Maogen Su	Application of LIBS spectral data fusion in quantitative analysis of Astragalus
AP-18	Yaopeng Yin, Duixiong Sun, Weiwei Han, Zongren Yu	Application of LIBS technique in Analyzing of Wall Paintings in Dunhuang Mogao Grottoes
AP-19 [ST]	Kou Kaikai, Song Weiran, Hou Zongyu, Wang Zhe	Quantitative combustion diagnosis by laser induced breakdown spectroscopy: effect of temperature
AP-20 [ST]	Kaifan Zhang, Zongyu Hou, Zhe Wang	Effect of spatio-temporal windows for spectral collection on laser-induced breakdown spectroscopy (LIBS) signal at different pressures
AP-21 [ST]	Qi Yang, Shunchun Yao, Weizhe Ma, Ziyu Yu	LIBS raster scanning analysis for aluminium alloy classification using a fiber-Nd:YAG orthogonal dual-pulse system
AP-45 [ST]	Junxiao Wang, Lei Zhang, Wangbao Yin	Theoretical study on signal enhancement of orthogonal double pulse induced plasma

Wednesday 28th		
CP-17	Ajchara Limsakul, Anongnad Teprak, Atitaya Siripinyanond, Juwadee Shiowatana	Development of a test kit for chromium determination in water
CP-18	Shigeru Suzuki, Yuta Uemura, Kozo Shinoda, Shigeo Sato	Characterization of structure changes in stress-induced martensitic transformation and shape memory properties of Fe-Mn-Si alloys
CP-19	Hiroyuki Nakata	The pH Response of Excitation-Emission Features in Fluorescein
CP-20	Shintaro Ichikawa, Yuta Ishikake, Yukiko Nishi, Satoshi Kawata, Hirofumi Yamakawa, Tsutomu Kurisaki	Characterization of iron sands around Mt. Aburayama (Fukuoka, Japan) by XRF, XRD, and Mö ssbauer spectroscopy
CP-21 [ST]	Shunya Inamoto, Yoshinari Abe, Akiko Hokura, Emiko Harada, Michio Suzuki	Distribution and chemical speciation of manganese in freshwater pearls by synchrotron radiation X-ray analyses
CP-22 [ST]	S. Ozeki, R. Kato, T. Tanaka, T. Yano	Surface-enhanced Raman spectroscopy of odor molecules using graphene-based plasmonic nanostructures
CP-23 [ST]	Masato Tokoro, Yu Imamura, Kazuhiro Kumagai, Akiko Hokura	Synchrotron X-ray analyses reveal the mechanism of Pt uptake in unicellular algae
CP-24 [ST]	Tatsuya Fukuta, Ryo Kato, Takuo Tanaka, Taka-aki Yano	Highly sensitive fluorescence spectroscopy using high-index dielectric nanoparticles
CP-25	Hirofumi Yamamoto, Yuichiro Saito, Kazuo Taniguchi, Akira Yoshikawa	The measurement of Bata rays assuming discharge of ALPS treated water into the sea at Fukushima Daiichi Nuclear Power Plant
CP-26	Akira Kuwahara, Kenta Murakami, Hideki Tomita, Youichi Enokida	Spectroscopic signatures of uranium atoms in laser ablation plasma plume under a high vacuum ambience
CP-27	Toshitsugu Marushima	Imaging Application using Raman Spectroscopy for Life Science
CP-28 [ST]	Naoki Daigo, Tomomi Iihara, Kozue Takano, Yuki Ito, Kazunari Maki, Shigeru Suzuki, Shigeo Sato	Effect of alloying elements on dislocation evolution in highly deformed copper alloys
CP-29 [ST]	Seiichi Karasawa, Kana Baba, Yusuke Onuki, Yuma Nagaoka, Masato Ito, Shigeru Suzuki, Shigeo Sato	Observation of dislocation evolution in Cu-Zn alloys during high-temperature deformation by using neutron diffraction
CP-30 [ST]	Kana Baba, Kazuhiro Mizusawa, Kozue Takano, Tomomi Iihara , Yuki Ito, Kazunari Maki, Shigeru Suzuki, Shigeo Sato	Variations in stress relaxation of kinds of alloying elements in solid-solution copper alloys
CP-31	Stefano Legnaioli, Beatrice Campanella, Susanna Monti, Vincenzo Palleschi, Francesco Poggialini, Giovanna Costanzo	Spectroscopic characterization of prebioitic molecules

AP-22	Tianzhong Luo, Mengyu Bao, Geer Teng, Xiangjun Xu, Kai Wei, Zhifang Zhao, Yongyue Zheng, Bingheng Lu, Qianqian Wang	Identification of three kinds of Mutong medicinal materials based on laser-induced breakdown spectroscopy
AP-23	Takahiro Karino, Katsuaki Akaoka, Hironori Ohba, Ikuo Wakaida, Joey Kim Soriano, Yuji Ikeda	Uranium isotope measurement by microwave-enhanced LIBS
AP-24 [ST]	Jeongcheol Ahn, Jaepil Lee, Jungwon Choi, Sungho Jeong, Jiyoung Ma, Jung-Je Woo	Development of the calibration model for Li-ion battery electrode concentration by laser-induced breakdown spectroscopy
AP-25 [ST]	Jaepil Lee, Sungho Shin, Seongguk Bae, Sungho Jeong	Method for improving classification accuracy of painted metal scraps during laser-induced breakdown spectroscopy analysis
AP-26	Chengjun Li, Zhimin Lu, Ziyu Yu, Shunchun Yao	Exploring the chemistry matrix effects in the quantitative analysis of potassium by LIBS
AP-27 [ST]	Yongyue Zheng, Geer Teng, Xiangjun Xu, Zhifang Zhao, Kai Wei, Tianzhong Luo, Yongyue Zheng, Bingheng Lu, Qianqian Wang	Femtosecond Laser-induced breakdown Spectroscopy studies for the discrimination of plastics
AP-28	Sang-Ho Nam, Hyang Kim, Yonghoon Lee	Laser-induced breakdown spectroscopy analysis of polished rice grains and their husks
AP-29 [ST]	Ioana Maria Cortea, Monica Dinu, Luminița Ghervase, Lucian Ratoiu, Ovidiu Țentea	A minimally-invasive multimethod approach for the study of paint-layer stratigraphy in some 2nd century polychrome murals
AP-30 [ST]	Gookseon Jeon, Woonkyeong Jung, Hohyen Keum, Kyunghwan Oh, Janghee Choi	Improving the robustness of laser-induced breakdown spectroscopy for industrial steel classification
AP-31 [ST]	Masashi Shintani, Yuko Yokoyama, Naoya Nishi, Tetsuo Sakka	Line width of Fraunhofer-type absorption in underwater LIBS
AP-32	Jiujiang Yan, Qingzhou Li, Fangjun Qin, Liangfen Xiao, Xiangyou Li	A polynomial interactive reconstruction method based on spectral morphological features in the classification of gem minerals using portable LIBS
AP-33 [ST]	Shixin Hu, Liang Chen, Yuan Lu, Wangquan Ye, Ziwen Jia, Ye Tian, Zengfeng Du, Xin Zhang, Ronger Zheng	Super-resolution algorithm in the spectral reconstruction of laser-induced breakdown spectroscopy for rare earth elements detection
AP-34 [ST]	Haorong Guo, Yada Chi, Zexuan Dong, Minchao Cui	Rapid analysis of steel powder for 3D printing using laser-induced breakdown spectroscopy
AP-35 [ST]	Shoujie Li, Yuan Lu, Wangquan Ye, Ye Tian, Ying Li, Jinjia Guo, Ronger Zheng	Evaluation of long-pulse laser in micro laser-induced breakdown spectroscopy for human teeth analysis
AP-36	Zhuoyan Zhou, Yuzhu Liu	LIBS in-situ online methane detection and analysis method based on C and CN spectral line competition
AP-37	Ryuzo Nakanishi, Morihisa Saeki, Hironori Ohba	Detection of trace metals in aqueous solutions by LIBS with liquid sheet jets
AP-38	Koji Tamura, Ryuzo Nakanishi, Hironori Ohba, Ikuo Wakaida	Radiation Effects for a Ceramics and a Single Crystal Microchip of a Laser-Induced Breakdown Spectroscopy (LIBS) System for Remote Analysis
AP-39 [ST]	Yusuke Shimazu, Hideo Nagahashi, Kosuke Suzuki, Haruka Nakano, Ayumu Matsumoto, Shinji Yae	Surface-enhanced LIBS using a porous silicon substrate —Introduction of fiber-optic system for remote analysis—
AP-40	Ryoichi Okada, Yoshihiro Deguchi	Development of high spatial resolution mapping LIBS measurement technique for picosecond lasers
AP-41 [ST]	Shilei Xiong, Nan Yang, Guangyuan Shi, Minchao Cui	A new idea of multi-modal fusion based on LIBS spectroscopy-laser ultrasound
AP-42	Jun Feng, Qihang Zhang, Xu Lu, Boyuan Han, Zhuoyan Zhou, Yuzhu Liu	On-line detection of VOCs in the atmosphere based on LIBS and Raman technology
AP-43	Tie Li, Ye Tian, Ziwen Jia, Jianjiang Dong and Ying Li	Correction method for spectra of underwater laser-induced breakdown spectroscopy under high-pressure conditions based on functional data analysis
AP-44 [ST]	Jiahui Liang, Lei Zhang, Wangbao Yin	Non-contact bacterial identification and decontamination based on laser-induced breakdown spectroscopy

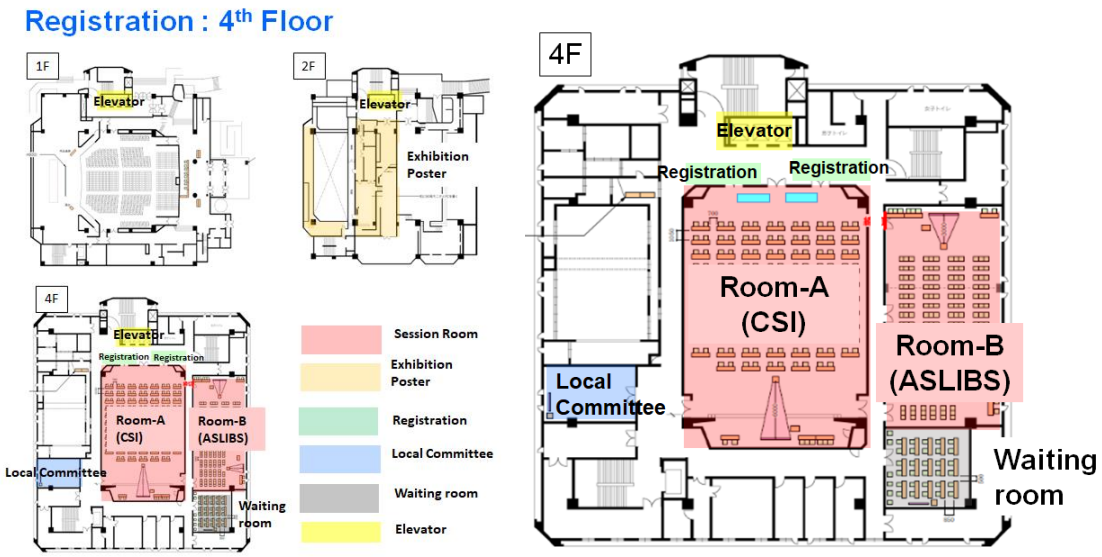
CONFERENCE VENUE

Conference venue:

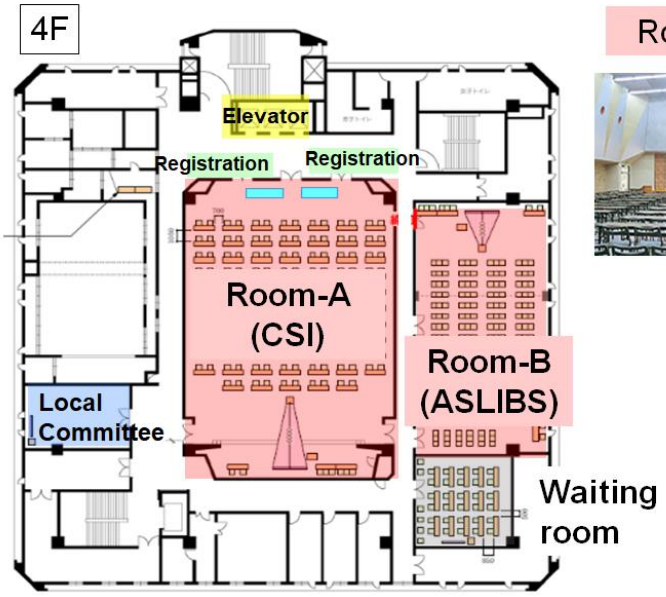
AWAGIN HALL

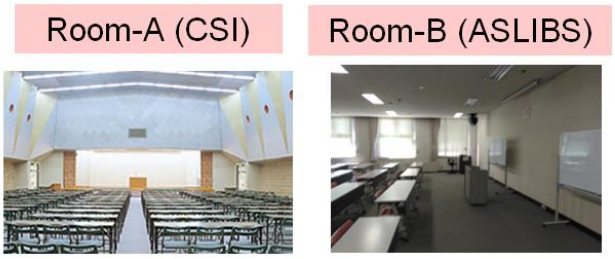
Address:

2-14,Aibacyo,Tokushimacity,Tokushima,770-0835,JAPAN



CSI XLIII/ASLIBS2023 : Main Hall (4th Floor)





Session Room

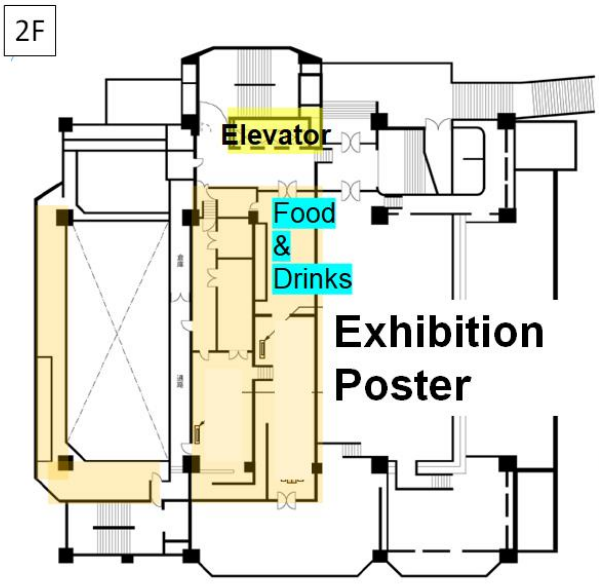
Registration

Local Committee

Waiting room

Elevator

CSI XLIII/ASLIBS2023 : Exhibition and Poster (2nd Floor)



Exhibition Poster

Elevator

Conference hours : Food and Drinks

Lunch Time : light meal
Rice balls, sandwiches, snacks, fruit

SPONSORS

Japanese LIBS Community

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The Iron and Steel Institute of Japan

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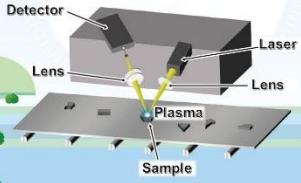

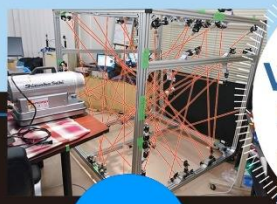

3D

Visualization
Room, Process

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Smart Laser & Plasma Systems (SL&PS) has the vision of a future where everything can be controlled automatically and remotely. We are promoting activities for the "FUTURE SOCIETY" by accelerating the automation of industrial processes using SL&PS technology.

SL&PS Products

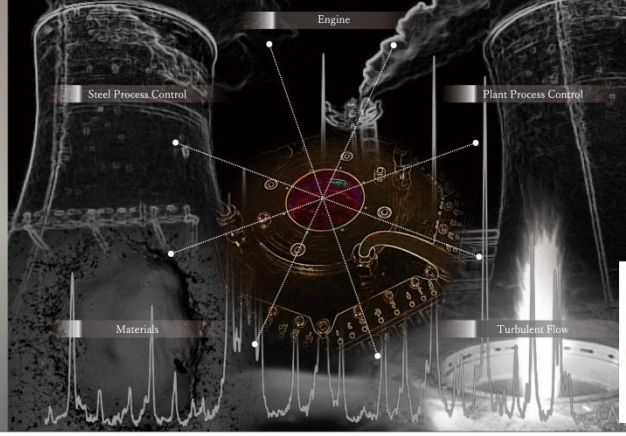
- **CT-TDLAS System** — *2D, 3D Temperature and Concentration*

- **LIBS System** — *Real-time and online elemental analysis*

- **Advanced Automatic Operating Platform**

BE ORIGINAL.

PRODUCTS AND TECHNOLOGY



- Spectroscopic Intelligence
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- Synergy of Industrial Innovation

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LIGHTIGO

Provider of effective Laser Spectroscopy based solution for routine material analysis. Through our innovation and know-how, backed by more than 25 years of scientific experience in the field of LIBS, we are delivering accurate, fast and reliable solutions combined with high performance, stability and user friendly experience.

Lightigo can meet your exact analytical requirements and become your partner for material analysis solutions.

FireFly

Your workhorse for the rapid multi-elemental analysis

FireFly Introduction

FireFly is an analytical instrument for rapid multi-elemental analysis and chemical imaging. It utilises the Laser-Induced Breakdown Spectroscopy (LIBS) - one of today's most promising technique of elemental analysis.

With FireFly, you can easily apply the key benefits of LIBS technology into your elemental analysis applications.

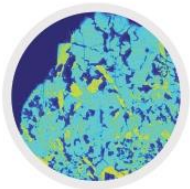
FireFly Applications

LIBS is fast and flexible technique. It is sensitive to the most of the chemical elements, detection limits of 1-100 ppm.

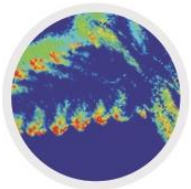
Application fields are numerous:

- Metallic, geology, plastic or biology
- Elemental imaging (mapping)
- Depth profiling of multiplayer materials
- Toxic / heavy metals detection
- Markers and nanoparticles detection
- Quality check / material sorting

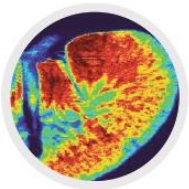
Geology



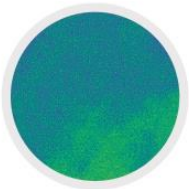
Biology



Tissues



Plastics



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LIBSLAB

Chemical multi-elemental analysis in modular benchtop design

- Customized setup: spectrometer, laser, LIBSpector sample chamber, PC
- Chemical analysis by means of laser-induced breakdown spectroscopy (LIBS)
- For solid, liquid and gaseous samples
- Sample mapping with short measurement times
- Flexible range of applications in industry and science

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Compact and high-resolution echelle spectrometer series for scientific and industrial applications

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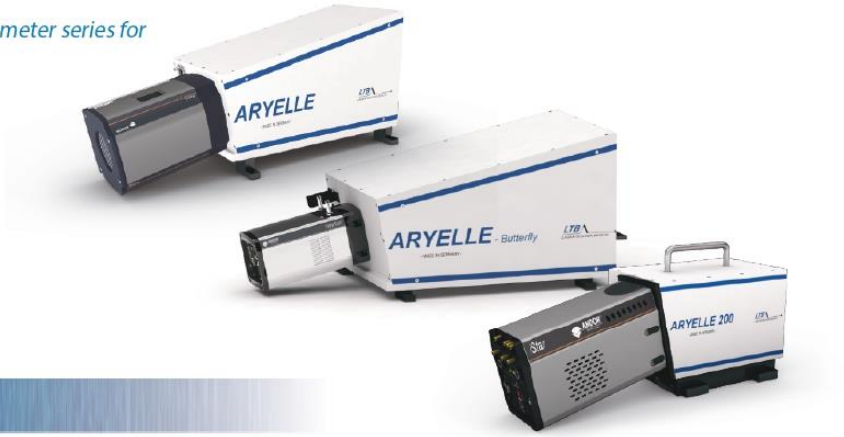
- 5,000-50,000 (λ/ΔλFWHM)
- 50-5 pm (λ/ΔR) at 250 nm
- 190-1,070 nm (λmax range)
- max. 740 nm (λsimul)



DEMON

Very high-resolution and optical throughput echelle spectrometer for isotope spectroscopy and laser quality control

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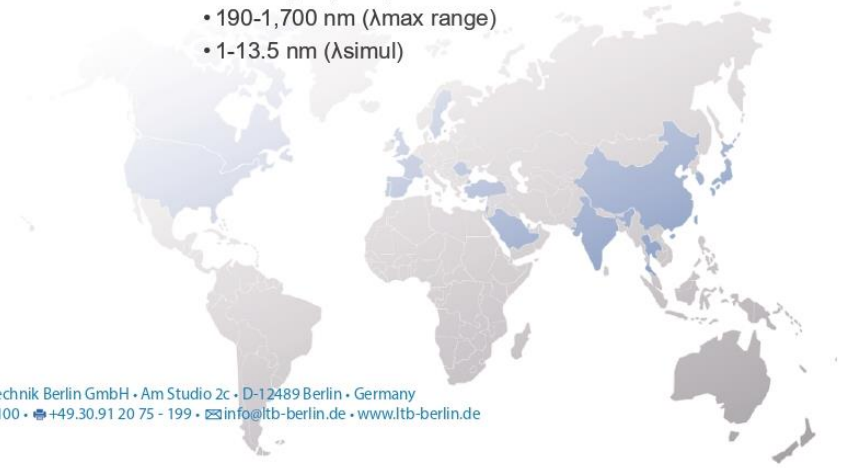
- 3.3-1.3 pm (λ/ΔR) at 250 nm
- 190-1,700 nm (λmax range)
- 1-13.5 nm (λsimul)



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ANALYZERS

CALIBSO

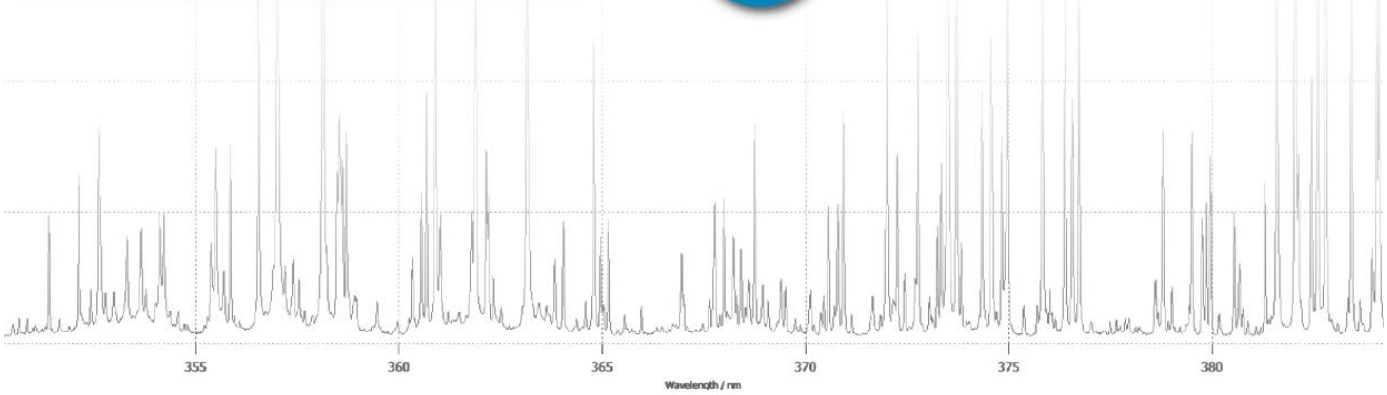
All-in-one LIBS System

High-quality sample imaging with micrometer sized resolution, single spot measurement or area scans

Durable diode pumped laser with a spot size of ~75µm on sample surface for high spatial resolution

High-resolution echelle spectrometer with spectral resolving power in the pm-range and a large simultaneous wavelength range

Material identification, classification and quantification of bulk materials or surfaces with univariate or multivariate data analysis



High-resolution sample image for surface scans and precise detail image for particle analysis

Combination of two high complementary spectroscopic techniques for the analyis of elemental composition and chemical structure

Unique two-wing echelle spectrometer as core part provides high resolution, large range and high light-throughput

Rapid material analysis in many fields e.g. technical cleanliness, forensics, geology and battery research

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Combined Raman LIBS System

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- 5-10ns pulse duration(optional <3ns pulse duration)
- Optional 2nd, 3rd, 4th or 5th stand-alone harmonic generators
- Compact design

Specification	
Wavelength	1064 nm or 1053 nm , with SHG / THG / FHG / FiHG
Repetition rate	10, 20, 33.3, 50, 100, 200 Hz
Pulse duration	< 5 ～ 10 ns @1053/1064 nm
Pulse energy	1 mJ@200 Hz ～ 120 mJ@10 Hz
Size	Laser head : 160 x 230 x 141 mm Controller : 108 x 191 x 59 mm Harmonic generator : 160 x 270 x 141 mm

Simultaneous measurement of two different spectral range

2 channel spectrometer, NP250-2 series

SOL instruments®

- Two spectral range simultaneous with CCD/ICCD
- Independent drive of two diffraction gratings arranged above and below
- Two diffraction gratings can be selected according to wavelength range or spectral resolution

Specification	
Usable wavelength range	185 nm ～ 60 μm
Number of ports	Input x 1, Output x 2
Number of simultaneously installed Gratings	2
F/number (for each channel)	1/6.1
Focal length@output	270 mm
Stray light	2.5×10^{-5}

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- High peak power density for facilitating plasma ignition
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Avantes has some great advantage in LIBS applications

Multirack in combination with resolution
Timing and triggering
Extensive knowledge on LIBS

AvaSpec-4096/2048 CMOS, USB3 multi-channel Spectrometer

High Resolution Measurement [Resolution: 0.2nm, 0.1nm]

AvaSpec-Multi-4CH, 0.2nm

AvaSpec-ULS2048CL/4096CL-EVO x 4

Ch1 UC:200-458nm
Ch2 VC:455-683nm
Ch3 NC:680-974nm
Ch4 NC:870-1030nm

4-furcated fiber-optic cables
FC4-UVIR400-2

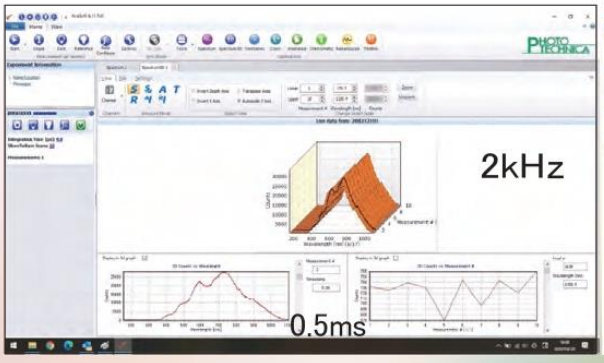
AvaSpec-Multi-8CH, 0.1nm

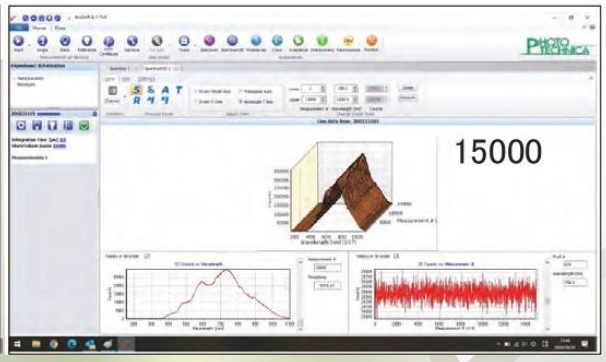
AvaSpec-ULS2048CL/4096CL-EVO x 8

Ch1 UE:200-320nm
Ch2 UE:318-420nm
Ch3 UE:417-505nm
Ch4 VE:500-565nm
Ch5 VD:563-670nm
Ch6 VD:668-750nm
Ch7 NC:745-930nm
Ch8 NC:920-1070nm

High Speed Trigger Measurement

Store To RAM [Internal Memory Save]
Single Scan External Trigger [1ms, 0.5ms]





AvaSpec Spectrometer	2048CL	4096CL
Data Transfer Speed (ms/scan)	0.38	0.70
Trigger Frequancy	2kHz	1kHz
Minimum Integration Time	9µs	9µs

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Date: June 26-30, 2023

Venue: AWAGIN HALL

Tokushima, JAPAN

CSI XLIII & ASLIBS2023

CSI XLIII & ASLIBS2023

COLLOQUIUM SPECTROSCOPICUM INTERNATIONALE XLIII & THE 5TH ASIAN SYMPOSIUM ON LASER INDUCED BREAKDOWN SPECTROSCOPY