

## PUBLICATIONS

2019

Localization of aluminum in epidermal cells of mature tea leaves

Y. Haruyama, T. Fujiwara, K. Yasuda, M. Saito, and K. Suzuki

Quantum Beam Sci.3, 9 (2019).

Change in Li Depth Profiles of Au/LCO/LATP/Pt Battery under Charging and Discharging Studied by Ion Beam Analysis Techniques with 9 MeV O<sup>+4</sup> Ions  
K. Morita, B. Tsuchiya, H. Tsuchida, and T. Majima  
Solid State Ionics 344, 115135(1-5) (2019).

Li Depth Profiles of Metal/Li-Electrolyte/Metal Capacitors under Biasing Studied by Means of MeV Ion Beam Analysis Techniques

K. Morita, B. Tsuchiya, H. Tsuchida, and T. Majima  
Solid State Ionics 344, 115085(1-5) (2019).

The impact of solar radiation on polar mesospheric ice particle formation

M. Nachbar, H. Wilms, D. Duft, T. Aylett, K. Kitajima, T. Majima, J.M.C. Plane, M. Rapp, and T. Leisner

Atmos. Chem. Phys. 19, 4311-4322 (2019).

Secondary electron-induced biomolecular fragmentation in fast heavy-ion irradiation of microdroplets of glycine solution

K. Kitajima, H. Tsuchida, T. Majima, and M. Saito  
J. Chem. Phys. 150, 095102(1-9) (2019).

Two- and three-photon double ionization of helium by soft X-ray free-electron laser pulses

H. Shimada, K. Komatsu, W. Komatsubara, T. Mizuno, S. Miyake, S. Minemoto, H. Sakai, T. Majima, S. Owada, T. Togashi, M. Yabashi, and A. Yagishita

J. Phys. B: At., Mol. Opt. Phys., 52, 065602(1-8) (2019).

Comparison of trace elements in freshwater pearls cultured in Japan, China, and USA

I. Sakakura, H. Tsuchida, Y. Sasaki, and M. Miwa  
Int. J. PIXE (2020) accepted.

Migration behaviour of vacancies and damage structure recovery in a Fe-based Fe-Cr-Mn-Cu-Mo multi-component alloy

Q. Xu, Z.H. Zhong, T. Zhu, X.Z. Cao, and H. Tsuchida

Philos. Mag. (2020)

(<https://doi.org/10.1080/14786435.2020.1740812>).

Li Depth Profiles of Metal/Li-Electrolyte/Metal Capacitors under Biasing Studied by Means of MeV Ion Beam Analysis

K. Morita, B. Tsuchiya, Y. Iriyama, T. Kato, H.

Tsuchida, T. Majima

22nd Int. Conf. on Solid State Ionics (SSI-22) (Jun. 16-21, 2019, PyeongChang, Korea).

Change in Li Depth Profiles of Au/LCO/LATP/Pt Battery under Charging and Discharging Studied by Ion Beam Analysis Techniques with 9 MeV O<sup>+4</sup> Ions  
K. Morita, B. Tsuchiya, J. Oonishi, T. Kato, Y. Iriyama, H. Tsuchida, T. Majima

22nd Int. Conf. on Solid State Ionics (SSI-22) (Jun. 16-21, 2019, PyeongChang, Korea).

In-situ Total Li Profiling of Solid State Li Ion Batteries under Charging and Discharging by Means of Transmission Elastic Recoil Detection Analysis with 5MeV He<sup>+2</sup> Ionss

K. Morita, B. Tsuchiya, R. Yen, J. Oonishi, Y. Iriyama, T. Kato, H. Tsuchida, T. Majima

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Influence of Secondary Electrons on Biomolecular Damage in Water by Fast Heavy-Ion Irradiation

H. Tsuchida, K. Kitajima, T. Majima, M. Saito, and T. Kai

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Secondary Ion Emission from Ethanol Droplet Surfaces by MeV-Energy Heavy Ion Impact

T. Majima, K. Kitajima, S. Mizutani, M. Saito, and H. Tsuchida

23th Int. Workshop on Inelastic Ion-Surface Collisions (IISC 23) (Nov. 17-22, 2019, Matsue, Japan).

Observation of recurrent fluorescence from naphthalene ions

H. Kubota, K. Suzuki, T. Majima, H. Tsuchida and M. Saito

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Incident molecular axis dependence of secondary ion emission from phenylalanine target by fast C<sup>2+</sup> impacts

R. Murase, Y. Hama, A. Chiba, K. Nakajima, T. Majima, M. Saito, and H. Tsuchida

23th Int. Workshop on Inelastic Ion-Surface Collisions (IISC 23) (Nov. 17-22, 2019, Matsue, Japan).

Fast ion imteractions with liquid jet targets under vacuum using the capillary microbeam method

H. Tsuchida, S. Nomura, T. Majima, and M. Saito

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Evaluation of Sensitivity for Oxygen by TOF-ERDA  
k. Yasuda, Y. Kajitori, M. Oishi, H. Nakamura, Y. Haruyama, M. Saito, and K. Suzuki

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Development of AMOC measurement system for radiation damage in materials under ion irradiation  
H. Minagawa, S. Konishi, S. Nakagawa, and H. Tsuchida

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Effect of gamma irradiation dose on radiation damage in polystyrene and fused quartz

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Optimized Alkali-Metal Cationization in Secondary Ion Mass Spectrometry of Polyethylene Glycol Oligomers with up to m/ z 10000: Dependence on Cation Species and Concentration

H. Gnaser, R. Oki, T. Aoki, T. Seki, J. Matsuo  
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Effect of ramping up rate on end of range defect in multielement molecular-ion ( $\text{CH}_3\text{O}$ )-implanted silicon wafers

R. Hirose, A. Onaka-Masada, R. Okuyama, T. Kadono, S. Shigematsu, K. Kobayashi, A. Suzuki, Y. Koga, J. Matsuo, K. Kurita  
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Selective Reduction Mechanism of Graphene Oxide Driven by the Photon Mode versus the Thermal Mode

M. Hada, K. Miyata, S. Ohmura, Y. Arashida, K. Ichiyangai, I. Katayama, T. Suzuki, W. Chen, S. Mizote, T. Sawa, T. Yokoya, T. Seki, J. Matsuo, T. Tokunaga, C. Itoh, K. Tsuruta, R. Fukaya, S. Nozawa, S.I. Adachi, J. Takeda, K. Onda, S.Y. Koshihara, Y. Hayashi, Y. Nishina

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Gas cooling secondary ions emitted by gas cluster ion beam at the travelling-wave ion guide of a Q-ToF-SIMS system

P. Thopan, T. Seki, L.D. Yu, U. Tippawan, J. Matsuo  
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Cluster ion beam bombardment and Q-ToF-SIMS analysis of large biomolecules

P. Thopan, T. Seki, L.D. Yu, U. Tippawan, J. Matsuo  
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Ambient Secondary Ion Mass Analysis of Electrolyte of Lithium Ion Battery with MeV-Energy Heavy Ion  
T. Seki, T. Nonomura, T. Aoki, J. Matsuo

23rd Int. Workshop on Inelastic Ion-Surface Collisions (IISC-23) (KUNIBIKI MESSE, Shimane, Japan 2019/11/20 ) Poster.

Etching by Massive Cluster Ions from Electrospray Ion Source" T. Matsuda, T. Seki, T. Aoki, J. Matsuo  
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MeV-SIMS Measurements under Ambient and Humid Conditions

T. Seki  
The 22st Int. Conf. on Secondary Ion Mass Spectrometry (SIMS22) (Miyako Messe, Kyoto, Japan 2019/10/25) Invited.

Development of a high energy cluster SIMS system with 50keV GCIB source

K. Hirata, T. Seki, T. Aoki, J. Matsuo  
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MeV-SIMS Measurement of Electrolyte of Lithium Ion Battery

T. Nonomura, T. Seki, T. Aoki, J. Matsuo  
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Angular Distribution of Neutral Species from Rhodamine 6G Sputtered with Cluster Ion Bombardment

R. Oki, N. Sano, T. Seki, T. Aoki, J. Matsuo  
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Optimized alkali-metal cationization in secondary ion mass spectrometry of polyethylene glycol oligomers with up to m/z 10000: Dependence on cation species and concentration

H. Gnaser, R. Oki, T. Aoki, T. Seki and J. Matsuo  
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Study on ionization process and quantitative analysis of organic molecules with cluster ion beam irradiation

M. Fujii, Y. Ishii, E. Hasegawa, R. Shishido and J. Matsuo  
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To be fragmented or not to be, that is the question in organic sputtering

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Generation of massive cluster ions with electrospray ion source

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Ionisation behaviours of high affinity molecules on the silk fibroin substrate using Ar GCIB

N. Sano, T. Hashimoto and J. Matsuo  
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Observation of Liquid Molecules with Ambient SIMS using Swift Heavy Ions

J. Matsuo, S. Toshio, A. Takaaki

The 24th Int. Conf. on Ion Beam Analysis (IBA24) (the Palais des Congrès of Antibes, France 2019/10/15) Oral.

Sputtering of biomaterials with large cluster ion beams

J. Matsuo  
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Thermal mixing enhancement of liquid metal film-flow by various obstacles under vertical magnetic field

K. Kusumi, T. Kunugi, T. Yokomine, Z. Kawara, Y. Wu, A. Sagara, T. Tanaka  
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K. Hanada, N. Yoshida, M. Hasegawa, A. Hatayama, K. Okamoto, I. Takagi, T. Hirata, Y. Oya, M. Miyamoto, M. Oya, T. Shikama, A. Kuzmin, Z. X. Wang, H. Long, H. Idei, Y. Nagashima, K. Nakamura, O. Watanabe, T. Onchi, H. Watanabe, K. Tokunaga, A. Higashijima, S. Kawasaki, T. Nagata, S. Shimabukuro, Y. Takase, S. Murakami, X. Gao, H. Liu, J. Qian, R. Raman, M. Ono  
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K. Hanada, N. Yoshida, I. Takagi, T. Hirata, A. Hatayama, K. Okamoto, Y. Oya, T. Shikama, Z. Wang, H. Long, C. Huang, M. Oya, H. Idei, Y. Nagashima, T. Onchi, M. Hasegawa, K. Nakamura, H. Zushi, K. Kuroda, S. Kawasaki, A. Higashijima, T. Nagata, S. Shimabukuro, Y. Takase, S. Murakami, X. Gao, H. Liu, J. Qian, R. Raman, M. Ono  
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Measurement of local temperature around the impact points of fast ions under grazing incidence  
H. Kokabu, S. Yoon, H. Lee, K. Nakajima, M. Matsuda, M. Satake, M. Tsujimoto, M. Toulemonde, and K. Kimura  
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Sensitivity improvement of bio-molecules using ionic liquid matrix in mega electron volt secondary ion mass spectrometry  
K. Nakajima, R. Tatemichi, F. Kobayashi, and K. Kimura  
*Nucl. Instrum. Methods B* 460 (2019) 128-131.

Mechanism of improvement in channel mobility of SiC-MOSFET by wet post-oxidation annealing studied using ion beam analysis techniques  
K. Nakajima, T. Matsumoto, K. Kimura, M. Nishida, and K. Kita  
Int. Conf. on Silicon Carbide and Related Materials 2019 (ICSCRM2019) (Kyoto, Japan, Sep. 29- Oct. 4, 2019).

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Radiation tolerant vacuum image sensor for robots working on removal of fuel debris  
Y. Gotoh, T. Morito, M. Nagao, T. Okamoto, T. Igari, T. Fukui, T. Masuzawa, Y. Neo, H. Mimura, N. Sato, M. Akiyoshi, and I. Takagi  
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Analysis of amino acids on tungsten needle by static voltage atom probe

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Photoluminescence Decay Rate of an Emitter Layer on an Al Nanocylinder Array: Effect of Layer Thickness

Y. Kawachiya, S. Murai, M. Saito, K. Fujita, and K. Tanaka  
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Development of Hybrid Improper Ferroelectric Layered Perovskites

S. Yoshida, H. Akamatsu, R. Tsuji, O. Hernandez, H. Padmanabhan, A. S. Gibbs, K. Mibu, S. Murai, V. Gopalan, K. Tanaka, and K. Fujita  
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Elemental analysis of cultured pearls by PIXE  
I. Sakakura, H. Tsuchida, Y. Sasaki, H. Hayashii  
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Upgrades of a time-of-flight elastic recoil detection analysis measurement system for thin film analysis

K. Yasuda, Y. Kajitori, M. Oishi, H. Nakamura, Y. Haruyama, M. Saito, K. Suzuki, R. Ishigami, S. Hibi  
*Nucl. Instrum. Methods Phys. Res., Sect. B: Beam Interact. Mater. Atoms*, 442, 53-58 (2019).

The impact of solar radiation on polar mesospheric ice particle formation

M. Nachbar, H. Wilms, D. Duft, T. Aylett, K. Kitajima, T. Majima, J.M.C. Plane, M. Rapp, and T. Leisner

Atmos. Chem. Phys., accepted.

Radiative lifetime measurements of metastable levels in Kr<sup>3+</sup> using electrostatic ion beam trap

M. Saito, H. Kubota, T. Majima, M. Imai, H. Tsuchida, Y. Haruyama

X-Ray Spectrom., accepted.

Secondary electron-induced biomolecular fragmentation in fast heavy-ion irradiation of microdroplets of glycine solution

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H. Shimada, K. Komatsu, W. Komatsubara, T. Mizuno, S. Miyake, S. Minemoto, H. Sakai, T. Majima, S. Owada, T. Togashi, M. Yabashi, and A. Yagishita

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S. Menk, P. Bertier, Y. Enomoto, T. Masunaga, T. Majima, Y. Nakano, and T. Azuma

Rev. Sci. Instrum., 89, 113110(1-11) (2018).

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S. Minemoto, H. Shimada, K. Komatsu, W. Komatsubara, T. Majima, S. Miyake, T. Mizuno, S. Owada, H. Sakai, T. Togashi, M. Yabashi, P. Decleva, M. Stener, S. Tsuru, and A. Yagishita

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Effects of electronic stopping power on fast-ion-induced secondary ion emission from methanol microdroplets

K. Kitajima, H. Tsuchida, T. Majima, and M. Saito

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High resolution Li depth profiling of solid state Li

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Ar 3p photoelectron sideband spectra in two-color XUV + NIR laser fields

S. Minemoto, H. Shimada, K. Komatsu, W. Komatsubara, T. Majima, T. Mizuno, S. Owada, H. Sakai, T. Togashi, S. Yoshida, M. Yabashi, and A. Yagishita

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Radiative lifetime measurements of <sup>2</sup>P<sub>3/2</sub> and <sup>2</sup>P<sub>1/2</sub> metastable levels in triply charged xenon using electrostatic ion beam trap

M. Saito, A. Chikaoka, T. Majima, M. Imai, H. Tsuchida, and Y. Haruyama  
Nucl. Instrum. Methods Phys. Res., Sect. B: Beam Interact. Mater. Atoms, 414, 68-73 (2018).

Molecular axis alignment of fast OH<sup>+</sup> ions passing through nanocapillaries

R. Murase, H. Tsuchida, A. Chiba, T. Majima, M. Saito

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Formation of nano-porous surface structures by fast C<sub>60</sub> beam bombardments

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AMOC measurements for polymers under ion irradiation

S. Konishi

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Damage evolution in polystyrene during ion irradiation studied by AMOC measurement

H. Minagawa, S. Konishi, H. Tsuchida  
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Two-color above threshold ionization of atoms by using femtosecond XUV free electron laser and NIR laser pulses

S. Minemoto<sup>1</sup>, H. Shimada, K. Komatsu, W. Komatsubara, T. Majima, T. Mizuno, S. Owada, H. Sakai, T. Togashi, S. Yoshida, M. Yabashi, and A. Yagishita

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Systematic study of kinetic energy distributions of fragment ions from multiply ionized  $C_2H_{2n}$  ( $n = 1-3$ ) as functions of the charge states

S. Yoshida, T. Majima, T. Asai, H. Tsuchida, and M. Saito

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Radiative lifetime measurement of metastable levels in  $Kr^{3+}$  using electrostatic ion beam trap

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Li Depth Profiles of Metal/Li-Electrolyte/Metal Capacitors under Biasing Studied by Means of MeV Ion Beam Analysis

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22nd Int. Conf. on Solid State Ionics (SSI-22) (Jun. 16-21, 2019, PyeongChang, Korea).

Change in Li Depth Profiles of Au/LCO/LATP/Pt Battery under Charging and Discharging Studied by Ion Beam Analysis Techniques with 9 MeV O<sup>+4</sup> Ions

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In-situ Total Li Profiling of Solid State Li Ion Batteries under Charging and Discharging by Means of Transmission Elastic Recoil Detection Analysis with 5MeV He<sup>+2</sup> Ions

K. Morita, B. Tsuchiya, R. Yen, J. Oonishi, Y. Iriyama, T. Kato, H. Tsuchida, T. Majima

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Fragmentation of multiply ionized polyatomic molecules in fast heavy ion collisions

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Cationization and fragmentation of molecular ions sputtered from polyethylene glycol under gas cluster bombardment: An analysis by MS and MS/MS

T. Prutchayawoot, H. Gnaser, R. Oki, T. Aoki, T. Seki, J. Matsuo  
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Improvement in Detection Sensitivity of Secondary Ions by Na Absorption with Mist Deposition Method on a PEG Surface

T. Matsuda, T. Seki, T. Aoki, J. Matsuo  
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Ambient Secondary Ion Mass Analysis of Fatty Acids with MeV-energy Heavy Ion

T. Seki, T. Aoki, J. Matsuo  
The 19th Workshop on Surface and Interface Analysis by Ion Beam (Kyoto Univ., Kyoto, Japan 2018/12/7) Oral.

Fabrication of multilayer lever structure by double-angled etching with reactive gas cluster injection

T. Seki, H. Yamamoto, T. Kozawa, T. Shojo, K. Koike, T. Aoki, J. Matsuo  
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Cluster Ion Beams: History and Technology

S. Yamada, J. Matsuo  
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SIMS Analysis of Liquid Materials in Low Vacuum with Large Cluster Ion Beam

T. Seki, K. Suzuki, T. Aoki, J. Matsuo  
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Chemical Analysis under Ambient Conditions using MeV-Energy Heavy Ion

T. Seki

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D. Muller, K. Molhave, S. Chikara, J. Matsuo, M. Willinger, A. Belianinov, H. Plank

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Adsorption of Liquids Measured with MeV-SIMS in Ambient

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Improvement in the Detection Sensitivity of Secondary Ions by Na Absorption with the Mist Deposition Method on a PEG Surface

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