[EE] Evening Poster | S (Solid Earth Sciences) | S-IT Science of the Earth's Interior & Tectonophysics

[S-IT22]Interaction and Coevolution of the Core and Mantle in the Earth and Planets

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Recent observational and experimental investigations have significantly advanced our understanding of the structure and constituent materials of the deep Earth. Yet, even fundamental properties intimately linked with formation and evolution of the planet, such as details of the chemical heterogeneity in the mantle and light elements dissolved in the core, remained unclear. Seismological evidence has suggested a vigorous convection in the lower mantle, whereas geochemistry has suggested the presence of stable regions there that hold ancient chemical signatures. The amounts of radioactive isotopes that act as heat sources and drive dynamic behaviors of the deep Earth are also still largely unknown. We provide an opportunity to exchange the achievements and ideas, and encourage persons who try to elucidate these unsolved issues of the core-mantle evolution using various methods, including high-pressure and high-temperature experiments, high-precision geochemical and paleomagnetic analyses, high-resolution geophysical observations, geo-neutrino observations, and large-scale numerical simulations. Since this session is co-sponsored by geomagnetism, paleomagnetism and rock magnetism division of the SGEPSS, contributions in geomagnetism and geodynamo simulation are also encouraged.

[SIT22-P21]Quatitative isotope imaging methods using secondary ion mass spectrometry

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Direct ion imaging with secondary ion mass spectrometry (SIMS) has been develped in various fields, such as Material sciences, Earth and planetary sciences, life sciences. Especially, quntitative direct ion imaging techniques has recently developed using SCAPS detector (e.g., Yurimoto et al., 2003).
In this study, we try to develop the stigmatic secondary ion imaging methods using Cameca ims-4fE7 SIMS at Kyoto University. The imaging detector system consists of micro-channnel plate (MCP), florescent screen and Cooled 16bit charged-coupled device (CCD) camera (BU-LN52 Bitrun Co.). This conventional imaging system needs to estimate the calibration parameter with conversion from ion to electron, and from electron to photon.
In principle, each micro-channel of MCP would be different conversion parameter for electron converted from secondary ions. Therefore, in order to estimate the qualitative ion imaging using this system, we need to estimate the error of this conversion parameter in different location of each channel.
In this talk, we introduce the estimation of calibration parameter between the light output count rate read by CCD camera and the count rate of secondary ions incident on MCP with different experimetal session. We will estimate the error of each nonlinear exponent parameter for five places (50 x 50 pixels) and these different parameter cause the error of about 5%. We will discuss it in detail with quantitative isotope imaging with application of high-pressure experiments.