[JJ] Evening Poster | M (Multidisciplinary and Interdisciplinary) | M-GI General Geosciences, Information Geosciences & Simulations

[M-GI27]Data-driven geosciences

convener:Tatsu Kuwatani(Japan Agency for Marine-Earth Science and Technology), Hiromichi Nagao(Earthquake Research Institute, The University of Tokyo), Takane Hori(独立行政法人海洋研究開発機構・地震津波海域観測研究開発センター)

Wed. May 23, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

It is important to extract essential processes and structures from observed data sets in order to understand and predict the dynamic behavior of the earth and planetary systems. Recently, many powerful methodologies have been proposed to extract useful information from high-dimensional data sets in information sciences. This session aims to provide an opportunity to gather various geoscientists to have a productive discussion for interdisciplinary collaborations.

[MGI27-P08]Bayesian estimation with replica exchange Monte Carlo method and application to geochemical problems

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Keywords:data-driven approach, Bayesian estimation, MCMC method

Geochemical data sets, such as major, trace and isotopic compositions, preserve precious information about various physical and chemical processes. For example, bulk compositions of igneous rocks directly reflect melting of original rocks, magma mixing and rock-fluid interaction in the earth's interior. However, it has been still difficult to extract physical and chemical processes quantitatively due to many unknown factors and insufficient quality of data sets. Recently, many sophisticated data-driven methodologies have been proposed to extract useful information from high-dimensional data sets in information sciences. In this presentation, we will introduce a data-driven analytical technique based on Bayesian estimation and replica exchange Monte Carlo (REMC) method, which is one of Markov chain Monte Carlo method, and its application to simultaneous estimation of melting ratios and a source mantle composition from MORB bulk compositions.