

Data-driven approach in geosciences

*Masato Okada¹, Igarashi Yasuhiko^{1,2}

1. Graduate School of Frontier Sciences, The University of Tokyo, 2. Japan Science and Technology Agency PRESTO

We introduce a project, called “the Initiative for High-dimensional Data-Driven Science through Deepening of Sparse Modeling”. The aims of this project are to establish a methodology for systematically extracting hypothesis or model from huge amount of high-dimensional data, and to build a core of research system to practice high-dimensional data-driven science in Japan.

Based on sparse modeling (SpM) and Bayesian inference, which are key technologies of the data-driven science, we introduce two examples of data-driven approach in geoscience. The first example is an application of SpM to geochemical discrimination of 2011 Tohoku tsunami deposits. The second one is an application of the Bayesian inference to maximum tsunami height prediction, by directly using the correlation between ocean-floor pressure gauges and coastal tsunami heights.