

## **Inversion Analysis Method of Coseismic Slip Distribution**

### **Using Three-Dimensional High-fidelity Model of Crustal Structure**

**\*R. Agata<sup>1</sup>, T. Ichimura<sup>1</sup>, M. Hyodo<sup>2</sup>, K. Hirahara<sup>3</sup>, T. Hori<sup>2</sup>, M. Hori<sup>1</sup>**

1 Earthquake Research Institute, The University of Tokyo, Japan

2 Japan Agency for Marine-Earth Science and Technology, Japan

3 Earth and Planetary Sciences, Graduate School of Sci., Japan

\*Corresponding author: [agata@eri.u-tokyo.ac.jp](mailto:agata@eri.u-tokyo.ac.jp)

Inversion analysis method of coseismic slip distribution is improved by using crustal models of higher fidelity. We have developed a mesh generation method for the high-fidelity finite element models of the Japanese Islands and a fast crustal deformation analysis method for the models. DOF of the models generated here is about 150 million. In this research, the method is extended for an inversion analysis of coseismic slip distribution. Since the inversion analysis needs the computation of several hundred slip response functions due to a unit fault slip assigned for respective divided cells on the fault, we develop a parallel computation method enhanced by dynamic load balancing with MPI Remote Memory Access. We present an application example of the proposed method on estimation of coseismic slip distribution for the giant 2011 Tohoku Earthquake.

**Keywords:** Coseismic slip distribution, High-fidelity model, Inversion analysis, Finite element model, Dynamic load balancing