

## Time dependent block fault modeling of southeast Japan

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#### Abstract

We conducted time dependent block fault modeling for southeast Japan. The result shows that slip deficit on the Philippine sea plate which takes block motion into account becomes smaller than that which does not take into account block motion. In particular, slip deficit of the Philippine Sea plate in the Tokai inland area disappears, as was confirmed in previous studies by many researchers.

#### Introduction

It is very important to estimate interplate coupling precisely so that we can get information about whereabout and moment magnitude of the expected large subduction earthquakes. In particular, it is an urgent task to prepare for the Tokai and Tonakai earthquakes along the Suruga and Nankai troughs. Under this circumstance, many studies have been conducted about the interplate coupling in southeast Japan. However, spatial and temporal interplate coupling has not been treated in detail. In this study, we developed an analytical code of time dependent block fault modeling and applied it to southeast Japan.

#### Analytical Procedure

Hashimoto et al(2000) conducted block fault modeling of Japan, using GPS data. In this study, we used the block model geometry of Hashimoto et al. (2000). That is we used rectangular faults in inland area defined by Hashimoto et al. (2000). The plate boundary in a subduction area was represented by superposition of spline functions. By using this geometry, we estimated interplate coupling in inland area and subduction zones. We used EW, NS, UD position time series at approximately 500 GPS sites. The period was set at 2008-2009

#### Results and Discussion

Time dependent block fault modeling shows that interplate coupling on the Philippine Sea plate decreases when we take into account a block motion. In Tokai region, coupling on the Philippine Sea plate disappears in deep inland area.

Keywords: time dependent inversion, block fault modeling , southeast Japan