

Long term vertical deformation of Boso Peninsula from leveling data using smoothed data fitting with ABIC

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1. Introduction

South Kanto district has large interplate earthquakes repeatedly by subduction of the Philippine Sea plate. The Taisho type earthquakes repeat 200-400 years, the Genroku type earthquakes repeat about 2000 years (Shishikura, 2003). The maximum slip of the 1923 Taisho earthquake is about 10m (Matsu'ura, et al., 2007), and slip of the 1703 Genroku earthquake is over 20m (Sato et al, 2008). These results suggest that coupling rates of the Taisho and Genroku events are 70-100 % and 30%, respectively. To investigate this difference in detail, we need study interseismic deformation. For this propose, leveling data are very useful, because leveling surveys have conducted since 1900 and interval is a few years. Since most of leveling data in Boso Peninsula are short profiles and observation periods did not coincide, we use a data fitting method developed by Fukahata et al. (1996). This method is space-time smoothed fitting with ABIC.

2. Data and analysis method

We obtain leveling data and tidal data from GSI Home Page. In analysis, we use 2D spline function for space and 1D spline function for time. We set two constraints on vertical displacements in space and time. To determine the best degree of these constraints, we can use ABIC.

3. Results

Although we are now analyzing the data, the Boso Peninsula appears to have two patterns of deformation. One is subsidence at south part and uplift at north part. The other one is uplift at south part and subsidence at north part. This suggests that coupling strength on plate boundary may change temporally.

Acknowledgements

We use leveling and tidal data by Geographical Survey Institute.

Keywords: crustal deformation, ABIC, leveling survey, interplate coupling, Boso Peninsula, long term deformation