

3D b value map of Japan

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The relationship of seismic activity and the b value of the Gutenberg-Richter law (Gutenberg and Richter, 1944) were studied since 50 years ago, and the b value will mostly rise between before and after a big earthquake. The negative relationship between the b value and stress field of the crustal deformations were pointed out. If so, a 3D map of b value distribution of whole Japan will tell us a current stress field of Japan, and this will probably contribute to large earthquake predictions in near future.

In this study, we used seismic data catalogue of the Japan Meteorological Agency since 1998 and SEIS-PC software by Yuzo Ishikawa (JMA) for the determination of b values for each areas 1 by 1 degree, and four depth layers (0-20km,20-40km,40-60km,60-100km). We constructed b value grid data and maps of the four depth layers using GMT software for making continuous surface of b value out of dispersive data. We also constructed b value map for 0-100km depth range in the same way (See Fig.1).

The map has a good relationship to Dilatation field of Japan by GPS analysis (Sagiya,2004) in several areas. We will continue this work so that those 3D b value map can include temporal change of b values.

b value 0-100km

