

## Stress Inversion Analysis Based on Velocity Field of the Japanese Islands

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In order to estimate stress change within the crust from the observed displacement rates, we devised a new stress inversion method which uses Airy's stress function. The merit of this stress inversion method is that we can estimate stress field without full knowledge of elastic property of the object and without taking derivatives observed quantity. Then we examined this method for simple cases changing elastic constants. This test showed that different elastic constants resulted in mostly identical stress distribution with analytical solutions.

Then we applied the stress inversion method to the Japanese Islands where Geographical Survey Institute has been operating a nationwide GPS array named 'GEONET'. We used velocity data estimated from three years of observations.

For applying this method to the Japanese Islands, we estimated boundary traction by two different approaches; the average stress change and stress drop data of large earthquakes. We used the result of latter case in discussion.

Comparison was made between observed 'total' strain and estimated 'elastic' strain. Results suggest, first that the latter looks larger than the former, indicating that we could estimate the distribution of rigidity by the stress inversion. Comparison with seismicity data suggest that inland shallow earthquakes seem to occur where rigidity is lower.