

Understanding of crustal activity based on temporal changes of spatial correlations between various geophysical measures (1)

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The inland earthquakes which occur in the Japanese islands reflect crustal activities which are originally caused by the interactions between four plates surrounding the Japanese islands. For understanding such crustal activities, we first collected different kinds of geophysical data such as seismicity, GPS, gravity anomaly, and geothermal gradient, which reflect crustal activities with different time scales. We then began to investigate the characteristic patterns in scatter diagrams, spatial correlations and their temporal changes between different geophysical measures in various regions.

We began with the work using the JMA hypocenter data and the GSI GEONET data, which were converted into some geophysical measures with a same grid format, for a year or two years with a time step of six months. Among the events with magnitudes above 6.5 which have occurred in Japan since 2000 by which GEONET was almost completely constructed, we first noticed the regions around the epicenters of the 2000 Western Tottori Earthquake and the 2004 Mid-Niigata Prefecture Earthquake and the time periods prior to these events.

In result, larger earthquake energies appeared to be radiated by relatively smaller-magnitude events six months to a year before the events in areas with smaller strain rates rather than larger ones. Changing regions, time periods, and pairs of data for analysis, we intend to inquire into the universality or regionality of this result, other types of crustal activities and their temporal changes. We show preliminary results obtained with seismicity data and GPS data here and introduce the outline of our work in the corresponding oral session.