Invisible Faults, revealed from Gravity Anomalies.

1997 Fiscal Year Final Research Report Summary

Invisible Faults, revealed from Gravity Anomalies.

Research Project

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08640530

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Allocation Type

Single-year Grants

Section

一般

Research Field

固体地球物理学

Research Institution

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gravity anomaly / horizontal gradient (of gravity anomaly) / invisible faults / Japanese Islands / detection of hidden active faults / basement structure

Research Abstract

Detailed gravity data now cover all over Japan for sufficient enough amount to discuss characteristic spatial variation of gravity anomalies.
Distribution of gravity anomalies indicates steep horizontal gradient zones of gravity anomalies. We defined the steep horizontal gradient zone of gravity anomaly (SHGZ of GA) is as of the zone in which the horizontal gradient of 16 mgals or larger sustains for at least 10 km for the first ordered of the horizontal gradient zone.
We analyzed distributions of the SHGZ based on our gravity database by using various image processing techniques. As a result, many SHGZ can be recognized all over Japan, but relatively rare over the Chugoku district. Even though the distribution of the many SHGZ do not coincide with the major geological tectonic boundaries, they appear in parallel within several tens km from them, suggesting that internal relationship between them.
Geological and seismological evidences suggest the SHGZ are hidden fault-type geologic structures in a deeper part of the upper crust up to about 10 km deep. Some of them may active faults.
In the Quaternary planes, where are covered by thick soft sediments, there are only limited tools to detect active faults in basement stratums.
Gravity anomalies, however have potential to reveal them through detailed gravity measurements.

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