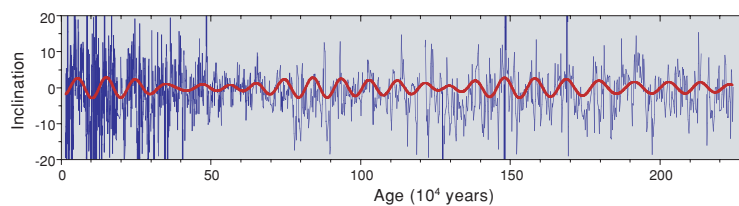


100,000-Year Periodicity in Earth's Magnetic Field Variations

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A continuous record of inclination and intensity of the Earth's magnetic field during the last 2250 kyrs was obtained from a marine sediment core of 42m long. This record reveals the presence of 100-kyr periodicity in inclination as well as intensity. Geomagnetic field is produced by fluid flows within the Earth's outer core, which

is called the geodynamo. The geodynamo was thought to be a self-sustained system within the core, but the discovery of the 100-kyr periodicity, which is longer than the electrical diffusion time of the core, indicates the presence of external energy sources: orbital eccentricity and paleoclimatic changes.



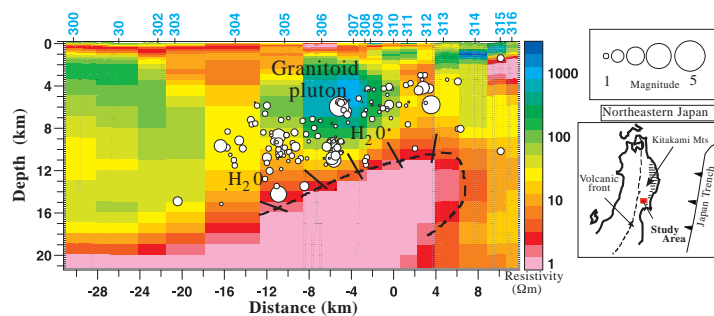
Long-term secular variation in inclination of the geomagnetic field. The 100,000-year variation component was extracted using a band-pass filter (red curve)

Electromagnetic Exploration to Detect Fluids in Seismogenic Regions

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Geophysical prospecting methods have been used for explorations of oil, mineral and geothermal energy resources, and recently are applied to civil engineering and environmental problems. We carried out magnetotelluric surveys, which is a kind of electromagnetic explorations, to investigate the electrical resistivity structure of the

seismogenic region of the 1962 Northern Miyagi Earthquake (M.6.5) in Miyagi Prefecture, northeastern Japan. As a result, a deep conductor was found and is interpreted as a fluid-filled zone. We suggest that the seepage of the fluid from the fluid-filled zone to the resistive granitoid pluton can become a trigger of the earthquakes.



Two-dimensional resistivity model obtained by an inversion of the MT data. The microearthquakes (circles) occur as though they cover the deep conductive zone (around 1Ω-m).