

# DEPTH VARIATIONS IN SEISMOGENIC LAYER AND SEGMENTATION OF ACTIVE FAULTS

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An active fault is a very useful indicator for a future large inland earthquake. However, the source area of an earthquake is located in the deep crust at depth between 3-5 and 25-20km. The zone is called the seismogenic layer and changes its depth from place to place. Therefore, it is significant to study the relationship between the variations in the cutoff depth of seismicity and those in the active faults. In particular, long faults, such as the Median Tectonic Line, have several segments. A surface layer overlay usually the seismogenic layer, and ruptures of earthquakes in the seismogenic layer do not always appear at the surface.

In this study, changes in the cutoff depths of seismicity in the Kinki, Chugoku and Shikoku districts are derived using the microearthquake data recorded and processed by universities in the past 30 years. The unified data by Japan Meteorological Agency since Oct., 1997 are also used for the same purpose. Considering the errors of the hypocenter determination, a simple statistical method is applied to estimate the cutoff depths. The D90% is defined as the depth above which 90 % events occur in a definite region. This depth roughly represents the cutoff of seismicity. In the strict sense, D90% is shallower than the real cutoff by about 2-3 km. However the depth is useful for the regional comparison of the cutoff depths.

The D90% depths are shallow in the Chugoku, Shikoku and Kii mountains and deep on the Sea of Japan in the Chugoku district and on the Pacific in Shikoku. The depth is also relatively deep in and on the Seto Inland Sea. The Cutoff depths changes with a wavelength of about 50-100km, which is likely to relate to the segments of the Median Tectonic Line. From the focal depth distribution, the changes in the cutoff of seismicity also seem to relate to the segments of the Median Tectonic Line.

Thus, the change in the cutoff depth of seismicity is possibly related to the sizes of inland earthquakes that occur at long active faults.