

## Changes in seismic wave velocities associated with the 1980 Izu-Hanto-Toho-Oki Earthquake (M6.7)

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Elastic wave velocities in rocks show stress dependence. The dependence can be used as a tool for measuring a stress state in the crust. We have previously reported the detection of a seismic wave velocity change caused by tectonic stress accumulation in the crust and that monitoring of stress is feasible with a precise measurement of the seismic velocity.

When a large earthquake occurs, the stress field around the fault markedly changes. The change in the stress field must generate a change in the seismic wave velocity. In this paper, we report a detection of the velocity change associated with the 1980 Izu-Hanto-Toho-Oki earthquake (M6.7).

The study area is the Kanto-Tokai region, Japan. During the period 1979- to 1986, seismic waves from seven detonations at the same location on Izu-Oshima Island were observed at 15 stations in the area. The Izu-Hanto-Toho-Oki earthquake took place within the study area in June, 1980. The observed travel times show large temporal variations. Removing effects of the stress change by the ocean tides from the travel times, we can obtain the secular component of the travel time change. Figure 1 shows the average secular travel time change for stations in Izu Peninsula. The average secular change shows a linear decrease with respect to time after December, 1980, which means the gradual velocity increase in the crust. However, there is a gap between the travel time in 1979 and one expected from the linear trend in 1980-1986. The value of the gap is about 4 msec. Similar travel time gaps are observed for station groups of the inland area and Izu-Oshima Island. The gaps can be well explained by abrupt travel time changes associated with the 1980 Izu-Hanto-Toho-Oki earthquake.

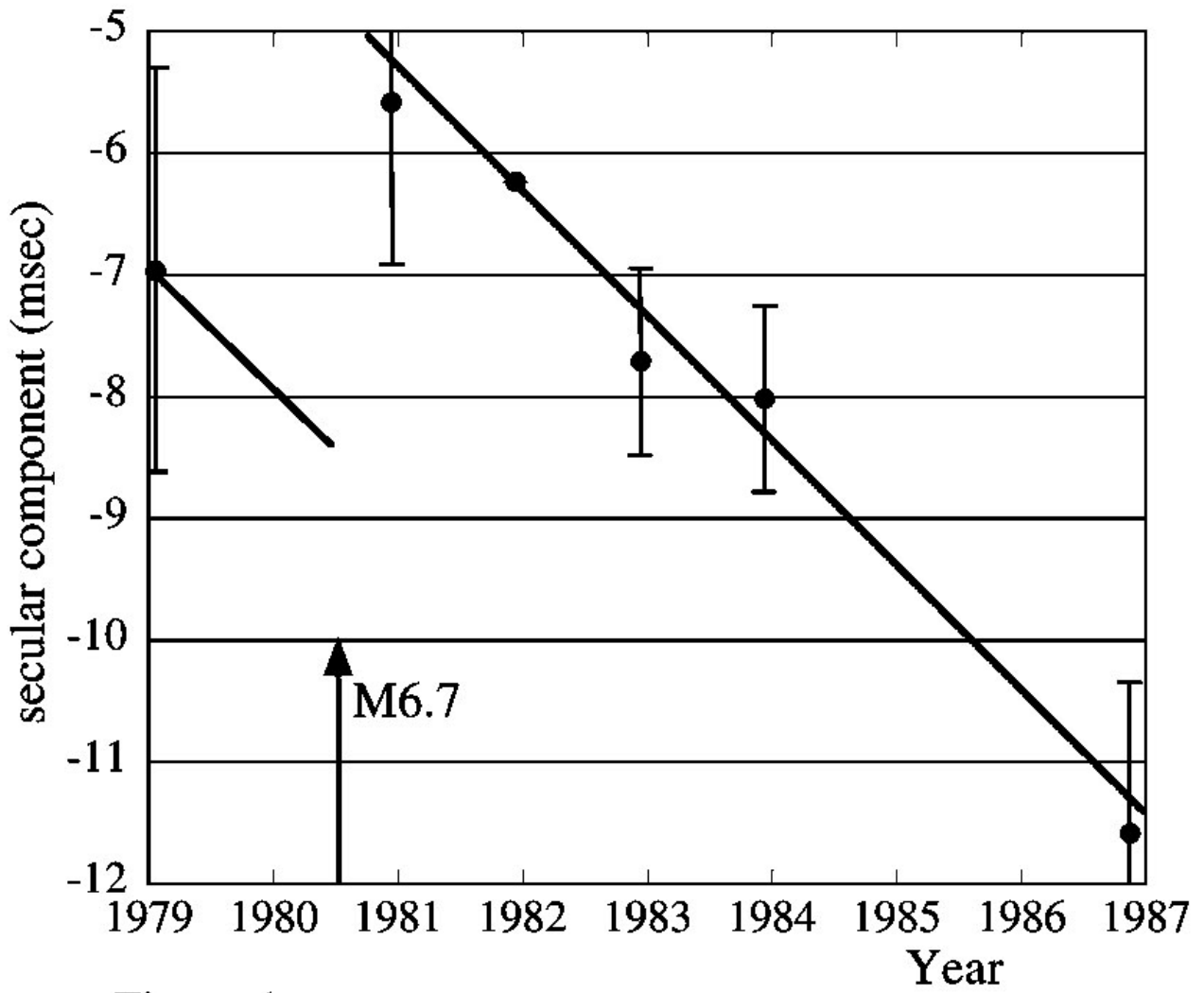


Figure 1