

Spatiotemporal distribution of shallow very-low-frequency earthquakes in Japan

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We investigated spatiotemporal distribution of shallow very-low-frequency (SVLF) earthquakes in Japan. In order to detect and locate SVLF earthquakes, seismograms in a period of July 2003 to December 2007 observed by tiltmeter network (Hi-net Tilt) having 722 stations with a 20-30-km spacing were analyzed by an array-signal-processing technique [asano et al, 2006]. A band-pass filter with a pass-band of 0.02 to 0.05 Hz was applied to the original seismograms; the filtered seismograms were re-sampled with a sampling frequency of 1 Hz. These re-sampled seismograms were used in the array analysis.

Epicenters of detected and located SVLF earthquakes are mainly distributed in the Kii-hanto-nanto-oki, the Hyuga-nada, and the Tokachi-oki regions. In the Kii-hanto-nanto-oki and the Tokachi-oki regions, SVLF-earthquake activities were started just after occurrences of the 2004 Kii-hanto-nanto-oki earthquake and the 2003 Tokachi-oki earthquake, respectively. Then these SVLF earthquakes may be caused by stress concentration into seismogenic regions of the SVLF earthquakes due to the large earthquakes; and the both activities will be getting decrease as the accumulated strain in the regions is released. On the contrary, in the Hyuga-nada region, many SVLF earthquakes have occurred in spite of no large earthquakes in the last 5 years. Therefore other stress-concentration processes without neighbor large earthquakes may exist and cause such an activity.