

SCG085-P05

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## The generation mechanism of deep low-frequency earthquakes revealed by detection program with waveform correlation

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An automatic deep low-frequency earthquakes detection program was developed using waveform correlation. This program has been built adding some improvements to Brown's method (Brown et al.(2008)). Using this program, a number of deep low-frequency earthquakes which Japan Meteorological Agency(JMA) didn't detect have been detected in western Shikoku, Tokai area, and southern Nagano Prefecture.

This automatic detection program tends to locate deep low-frequency earthquakes on the back arc side of the epicenters of JMA. Deep low-frequency earthquakes have 2-5Hz and more than 10 Hz spectrum peaks, which may indicate that the shear fracture occur at the starting point of fracture on the fore arc side, while low frequency waves are amplified on the back arc side. These mechanism generate deep low-frequency earthquakes and tremors which are aggregation of the low-frequency earthquakes.

No deep low-frequency earthquake was detected by this auto-detection program in the northern area and the eastern area of southern Nagano Prefecture. In the northern area, as water released by dehydration of oceanic crust of the Philippine Sea Slab is absorbed to mantle wedge when the slab reaches the mantle wedge, deep low-frequency earthquakes would not be able to occur. In the eastern area, relative low temperature on the surface of Philippine Sea slab would constrict dehydration.

**Keywords:** deep low-frequency earthquakes, deep low-frequency tremors, automatic detection, waveform correlation, dehydration, phase transition