The system of the short period tremor at the shallow part of the Aso volcano edifice.

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At Aso volcano, Kyusyu, Japan, three types of volcanic tremor are observed: 'long period tremor', 'isolated tremor', and 'continuous tremor'. The long period tremors have the period of 15 seconds, and the spatial variation of their amplitudes are explained by a combination of isotropic expansion (contraction) and inflation (deflation) of a tensile crack beneath the volcano (Yamamoto et al., 1999). The dominant frequency of the isolated tremors is 2Hz, and their sources are located about 600m beneath the first crater (Mori et al., 2004, Yamamoto, 2004). The continuous tremor has dominant frequencies between 3 and 10 Hz and has approximately constant amplitudes without any clear beginning and ending.

The model of generation of long period tremors and isolated tremors is as follows (Yamamoto, 2004): Volcanic gas ascends through the crack-like conduit, and long period tremors are generated. Next, at the top part of the crack, cylindrical conduit is deformed and isolated tremors are generated.

On the other hand, we don't have the clear model about a generation of continuous tremors in the conduit system beneath the Aso volcano. In this study, we discuss about continuous tremor.

In November 1999, the joint team of Tokyo University, Kyoto University, and Tokyo Institute of Technology observed volcanic tremors at Aso using short period seismometer arrays for 3 days. In our previous study, we proposed that there are two independent sources of continuous tremor, one at west and the other at south of the crater. They are at least 300m apart from each other (Takagi et al., 2004). Since the amplitude of the southern source changed with time, the estimated azimuth and slowness varied according to which signal dominates the seismograms of the array.

The spectrum of continuous tremor has some peaks. In this study we investigate the largest peak at 4.7 Hz. The results are as follows:

(1) As the result of the f-k spectrum analysis, the slowness for this peak is smaller than that for the other frequency. We conclude that body waves are dominant for this peak. Using the slowness value, the source depth is estimated shallower than 350m.

(2) This peak at 4.7Hz is observed at both the two arrays, which were installed at about 700m west and north of the first crater. This indicates this peak results neither from site effects nor from propagation effects, but from source processes.

(3) The feature of the spectrum of continuous tremor does not vary according to which of the two sources dominates the seismogram. This implies that the two sources generate seismic waves which have the same spectrum peak at 4.7Hz.

We conclude that two sources which are apart more than 300m from each other have the same largest source spectral peak at 4.7Hz. Assuming that this peak is due to the resonance of resonators, the two resonators with apparently separated locations must have either the same dimension and the some elastic properties. Instead, we suggest the model that the forced oscillation is applied to the two different resonators.