Extention of the crack wave theory and its application to the long period tremor at Aso volcano

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In two phase system of solid and fluid, there exist a class of waves which travel with slower phase velocity than any of the compressional waves of the pure materials consisting the system.

Chouet (1986) showed the existence of the wave which propagates with very slow phase velocity in his study on the dynamics of a fluid-filled crack.

We extended his theory and include the boundary condition which allow the fluid motion at the end of the crack. Our numerical result shows the existence of the normal mode which corresponds to the opening/closing of entire crack. The amplitude of the mode depends on the impedance contrast at the boundary.

We also present the application of the crack motion to the long period tremor observed at Aso volcano.