

## Detectability of Magmatic Activity in Eastern Izu Peninsula by Active Electromagnetic Observation Network

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In eastern Izu Peninsula, activities of earthquake swarms and submarine volcanisms have been repeatedly occurred since 1974 Off Izu Peninsula earthquake ( $M=6.9$ ). Since the occurrence of 1978 Near Izu-Ohshima earthquake ( $M=7.0$ ), swarm activity has strongly increased and submarine eruption had taken place in 1989, followed by intrusive events of dikes associated with swarm activities almost every years until 1998. These activities in the shallow crust have ceased since then. The reason why this quiescence continued for more than 10 years has left unanswered so that the necessity of the construction of observation network is apparent, because of anticipated reactivation of dike intrusions events associated with heavy swarms is the most likely. The working hypothesis of fluid driven mechanism (Sasai, et al., 2001) to explain the crustal deformation associated with dike intrusion should be tested.

In this report, we will present some results of model calculation about possibility of detectability of magmatic activity in eastern Izu Peninsula by active electromagnetic observation network, which is named ACROSS. ACROSS (Accurately Controlled Routinely Operated Signal System) is a controlled source system continuously transmitting very accurately controlled sinusoidal signal both for electromagnetic and seismic waves. Essential point of ACROSS is noise-robust observation system of acquiring the transfer function between a pair of signal source and receiver. This system is expected to monitor the structural sensitive observables; Anisotropy, dispersion, etc.

By assuming to reuse two electrodes separated to 2.2km as a dipole source, the effects of dike intrusion are estimated with a simplified horizontally layered models of both amplitude and phase of electromagnetic waves for frequency range between 0.01 to 10 Hz. Preliminary results indicate that the difference of phases could be detectable for 0.1 to 1Hz when a dike intrusion took place as sill-like configuration at depth between 7.5 to 10 km that depth range were expected the occurrence of swarms associated with dike intrusion. As assumptions made are too simple to verify the working hypothesis of fluid driven mechanism for crustal deformation, more detailed analyses by using data from appropriate observation system are obviously needed.