霧島硫黄山でとらえられた2016年熊本地震活動に伴う電磁気シグナルについての第1報

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The first report of coseismic EM signals in the 2017 Kumamoto Earthquake Sequences by the Iwo-yama MT campaign

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Coseismic EM signals associated with large inland earthquakes were often detected and reported in the previous studies. The mechanism for generating those signals, however, have not been understood clearly, although several mechanisms were proposed in terms of piezo-electricity, piezo-magnetism, motional-induction or electrokinetic effect. In order to clarify the mechanism, it is desirable to catch the signal at not a small number of stations and to investigate characteristics in spatiotemporal distribution of the signals, with seismic recordings nearby the EM sites. However, due to rare occurrence of the inland earthquakes, such observations were rarely reported in the previous literatures especially for the main shocks.

In Iwo-yama area in the Kirishima volcanic group, in Kyushu, SW Japan, we performed an MT survey to investigate recent volcanic activities (inflation of the volcanic body, activation in the volcanic gas eruptions and development of the thermal anomaly). We put 7 ADUs (Metronix, Ex, Ey, Hx, Hy, Hz) and 20 ELOGs (NT System Design, only Ex, Ey) around the Iwo-yama volcano and measurements at all the stations started from day time (in JST) on April, 14, 2016. We recorded EM time series of 32 Hz from 0:00 to 23:50UT and that of 1024Hz from 17:00 to 18:00UT, every day. After then, the foreshock and the main shock of the Kumamoto earthquake occurred respectively at 21:26 JST on April 14 and 01:25 JST on April 16. EM signals cause. The data were acquired until day time (in JST) of April 28 at all the stations except 2 stations. Thus, we could get EM signals associated with the seismic waves propagated from the Kumamoto earthquake focal areas.

There also exists continuous seismic stations operated by ERI, JMA and NIED in the area. Among all, the station KAR by ERI was located very close to one of the E stations and we could directly compare the time series of EM and seismic signals for almost all the main earthquakes occurred in the 2016 Kumamoto Earthquake sequences. In this presentation, we will show basic characteristics of both of the pre-wave and co-wave EM signals and comparison with the seismic records.