



Very-Long Period seismicity associated with magma intrusion of Merapi 2010 eruption

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Merapi volcano eruptions in 2010 were associated with an intense period of seismicity, observed by the permanent short-period seismological network and broadband seismometers set-up within the MIAVITA European project. On the basis of the frequency content and duration of recorded signals, earthquakes at Merapi volcano are usually classified as volcano-tectonic events either deep (VTA) or shallow (VTB), multiphase earthquakes (MP), long-period/low frequency earthquakes (LP/LF), tremor (T), rock-falls (RF), pyroclastic flows (PF), regional tectonic events (T) and teleseisms (TE). Before the first eruption on October 26th, intensifying seismicity was characterised with swarms of more than 1000 volcano-tectonic events, corresponding to the response of the edifice to new magma intrusion and more than MP events. We found and describe Very-Long Period (VLP) signals, occurring within swarms of volcano tectonic events. The analysis of the sequence of the events at different frequencies and polarization analysis suggests that the high frequency content of the seismic signal (VT) may be associated with the response of rocks and hydrothermal system surrounding the intrusive magma, while the VLP component of the signal may be associated with magma movement in the newly damaged area. Within a specific swarm, the location analysis of the VT earthquakes and full wave form inversion of the VLP signal with detailed analysis of the moment tensor components will allow us to describe further mechanisms of this intrusion process.