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Sustained low-frequency seismic activity as possible far-field expression of the 2015/2016 Mt Bromo's volcanic unrest, East Java, Indonesia.

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From January 2015 to November 2016 low frequency (0.2-2 Hz) seismic signals have been constantly observed on instruments deployed over an area of 120x80 km in East Java, Indonesia. The signals were recorded by several permanent seismic stations belonging to the Indonesian seismological service BMKG. These stations surround a temporary network of 31 seismic stations deployed within the framework of the ERC-funded Lusi Lab project. The
temporary network investigated the Lusi sediment-hosted hydrothermal system, the Watukosek fault zone and the Arjuno-Welirang volcanic complex.
More than 30000 events (Type 1) were detected during two years of survey. These events typically last about two minutes and their number and amplitude change through time defining periods of low versus high activity alternating every ca. four months. The emergent arrivals and the low similarity between waveforms recorded at different stations do not allow to locate such signals with certainty.
A continuous tremor (Type 2) has been recorded from November 2015 to January 2016 which progressively evolves in the Type-1 events suggesting that similar processes may generate these types of signals. The epicenter of the Type-2 tremor has been located with a cross-correlation approach at Mount Bromo, an active volcano located 35 km from the closest recording seismic station. The Type-2 signal began two weeks before the onset of Mount Bromo's eruptive activity (12 November 2015) and its temporal evolution is consistent with the reported episodes of unrest observed at the volcano. Such evidence suggests that the recorded events could be related to the volcanic activity of Mount Bromo. However, the complexity of the signals and the lack of a refined location do not allow to rule out different sources, such as processes related to the subduction of the slab.