



On the use of an infrasonic array at Singapore for volcanoes monitoring

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Violent volcanic eruptions are common in the Southeast Asia. Southeast Asia, bordered by active subduction zones with hundreds of active volcanoes. The physical condition at the eruptive vent is difficult to access and new methods are needed. The use of an infrasonic array located at Singapore will help to determine the pressure condition at the eruptive vent. And the location of Singapore with respect to those volcanoes makes it the perfect site to identify erupting volcanoes based on the wavefront characteristics of the recorded signal.

There are 346 active or potentially active volcanoes within 4000 kilometers of Singapore. They have been combined into 23 volcanic zones that have clear azimuth with respect to Singapore. Each of those zones has been assessed for probabilities of eruptive styles, from gentle (Volcanic Explosivity Index of 1) to cataclysmic (VEI 8) based on remote morphologic analysis. Ash dispersal models will be run using wind velocity profiles of the region for the last 3 years and hypothetical eruption scenarios for the whole range of eruption explosivities. Results can be used to estimate the likelihood of ash at any location in SE Asia.

Due to the location of Singapore close to the equator, seasonal changes in the wind velocity structure of the atmosphere will strongly affect the potential to detect small volcanic eruptions at certain azimuths. According to its location, each volcanic zone will be associated with a threshold value (minimum VEI detectable) depending on the seasonality of the wind velocity profile in the region.