# Understanding Unzen volcano magmatic system by broadband Magnetotelluric observation

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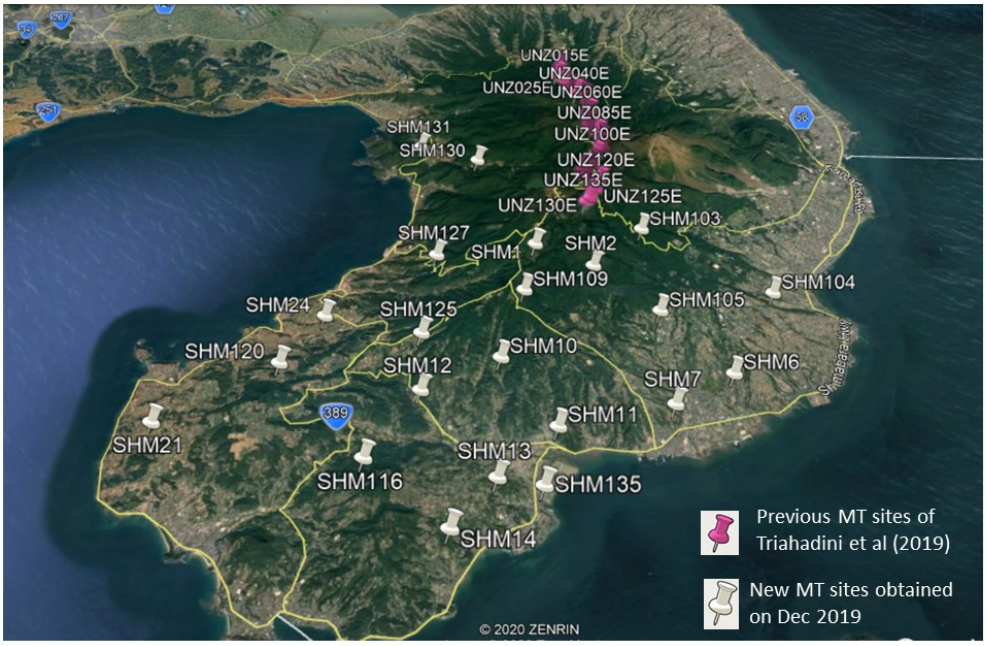
The magma system of Unzen volcano are believed to be sourced from under Chijiwa bay, 15 km west of Shimabara Peninsula, Nagasaki. Most of the magma chamber models of Unzen are derived from ground deformation measurement, i.e Kohno et al (2008) who used deformation data before and several years after 1991-1995 eruption. According to them, four pressure source models are proposed which located below the intensive smarm zone before eruption reported by Umakoshi et al (2001). Among the pressure sources, the most intensive sources are pressure source D which situated about 15 km under Chijiwa bay and pressure source C is located 5-6 km west of the active dome (Fugendake and Heisei-shinzan) at about 6 km depth. The D source explains why in the surround area underwent ground uplifting after the eruption ceased while the C source experienced deflation during eruption. After considering petrology data by Sugimoto et al (2005), these pressure sources are later concluded as deep basaltic magma reservoir and shallow crust dacite chamber respectively. Thus, more than one magma chambers related to Unzen volcano are expected below Shimabara Peninsula. During December 2019, we installed 23 MT sites consisted of 7 sites to record both E-field and B-field and 16 sites for E-field only. The sites were distributed across Minami-Shimabara and Obama area, around the suspected area of D and C pressure source. The distance of each sites are approximately 2-4 km where the recording period is 4-14 days depends on the site. Our purpose of study is to determine magmatic system of Unzen in correlation with pressure sources D and C. If they are existed than they are possibly detectable using MT. Because MT method is highly sensitive to conductive zone such as fluid rich zone or melt rich magma. Currently, we are processing the acquired data. At glance, the phase tensor and tipper at longer period > 100s are roughly aligned toward Southwest direction. For the inversion, we will include the MT data from several stations located in 2 km west of the summit, previously obtained by Triahadini et al (2019). Thus, we will present more complete analysis of the resistivity structure in the JPGU meeting.

Keywords: Unzen, Shimabara Peninsula, Magma Chamber, MT, Resistivity




MT observation sites of Shimabara Peninsula. Figure was made using Google Earth