Three-dimensional seismic velocity structure in Kyushu including the source region of the 2016 Kumamoto earthquake

*Azusa Shito[1], Satoshi Matsumoto[1], Hiroshi Shimizu[1], Group for urgent joint seismic observation of the 2016 Kumamoto earthquake

1.Institute of Seismology and Volcanology, Kyushu University

The 2016 Kumamoto earthquake is a series of earthquakes, including an earthquake with magnitude of Mj=7.3 which occurred on April 16, 2016 beneath Kumamoto City, the preceding earthquake with magnitude of Mj=6.5 which occurred on April 14, 2016, and many triggered aftershocks. The two main earthquakes were located along the Futagawa and Hinagu fault zones in the west area of Beppu-Shimabara graben.

The purpose of the study is to reveal detailed crustal structures and its tectonic process of the successive large earthquakes generation. We estimated three-dimensional seismic wave velocities in the crust beneath Kyushu including the source region of the Kumamoto earthquakes by applying double-difference tomography method [Zhang and Thurber, 2003]. The local earthquake data (from January 2000 to July 2013, m > 2, depth < 30 km) were collected by the Institute of Seismology and Volcanology (SEVO), Kyushu University. For the tomographic inversion, we used 159,103 P-wave and 115,265 S-wave arrival times from 4,126 local earthquakes. The initial velocity model is the same as the one used for routine earthquake location processing in SEVO, Kyushu University.

We will discuss the relation between the 2016 Kumamoto earthquakes and the tectonic background inferred from the seismic wave velocity structure.