## Density Structure Model Estimated from Gravity Survey around Mashiki damaged by 2016 Kumamoto Earthquake

Shun Araki<sup>2</sup>, Tatsuya Noguchi<sup>3</sup>, Masao Komazawa<sup>4</sup>, Shoya Arimura<sup>3</sup>, Mitsuhiro Tamura<sup>3</sup>, Kei Nakayama<sup>3</sup>, \*Hitoshi Morikawa<sup>1</sup>, Takashi Miyamoto<sup>5</sup>, Kahori Iiyama<sup>1</sup>, Yoshiya Hata<sup>6</sup>, Masayuki Yoshimi<sup>7</sup>, Takao Kagawa<sup>3</sup>, Hiroyuki Goto<sup>8</sup>

1. Department of Urban Design and Built Environemt, Tokyo Institute of Technology, 2. Department of Civil and Environmental Engineering, Tokyo Institute of Technology, 3. Department of Management Social Systems and Civil Engineering, Tottori University, 4. Oyo Corporation, 5. Department of Civil Engineering, Yamanashi University, 6. Division of Global Architecture, Osaka University, 7. Geological Survey of Japan, AIST, 8. Disaster Prevention Research Institute, Kyoto University

Gravity survey has been carried out around downtown of Mashiki, Kumamoto, Japan, where is severely damaged by 2016 Kumamoto earthquake, from November 28 to December 2, 2016. We applied three LaCoste gravimeters and one Schintrex CG-3M. Closed observations were carried out at more than 300 sites around the central part of Mashiki with about 50-meter intervals. And, more than 150 sites surround the central part with 250- to 500-meter intervals. The observation sites satisfy enough density to discuss density structure shallower than 500-meter depth around central part of Mashiki. After applying some corrections to the observed data, the Bouguer anomaly is calculated under the assumed density of 2.4 g/cm<sup>3</sup>. Furthermore, gravity basement is estimated under an assumption of two layered medium with density difference of 0.5 g/cm<sup>3</sup>. As a result, a graben runs parallel to the Akitsu river and some isolated small basins are found inside of the graben. The central part of Mashiki is located immediately above of the one of such the small basins. This may suggest that the focusing phenomena of seismic rays.

Keywords: Gravity Survey, Mashiki, Kumamoto, Japan, Density Structure



Bouruer anomaly (assumed density = 2.4 g/cm<sup>3</sup>)



Gravity basement (density difference = 0.5 g/cm<sup>3</sup>)