



Absence of prompt gravity signal induced by the 2011 Tohoku-Oki earthquake in data recorded by gravimeters and seismometers

Masaya Kimura (1), Nobuki Kame (1), Shingo Watada (1), Makiko Ohtani (2), Akito Araya (1), Yuichi Imanishi (1), and Masaki Ando (3)

(1) Earthquake Research Institute, The University of Tokyo, Tokyo, Japan (mkimura@eri.u-tokyo.ac.jp), (2) National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan, (3) Department of Physics, Graduate School of Science, the University of Tokyo, Tokyo, Japan

During an earthquake rupture transient gravity changes are expected to occur at all distances even before the arrival of seismic waves. Finding such a prompt gravity signal is a challenge in seismology and recent research reported identification of an averaged signal level during the 2011 Tohoku-Oki earthquake exceeding the background noise with a statistical significance higher than 99%. Here we look for the time-varying prompt gravity changes, i.e. the waveforms through a conventional low-pass filtering method. We use the data recorded by gravimeters and broadband seismometers, and compare them with the theoretical waveforms. Our preliminary results show the absence of the prompt earthquake signals even though the data have signal-to-noise ratio enough for identifying the waveforms, which suggests that the current simple model may have a defect and cannot be applied to signal identification.