

Gravity changes due to the 2011 Tohoku earthquake recorded by superconducting gravimeters

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The 2011 Tohoku earthquake caused large scale crustal deformations, both coseismic and postseismic, in a wide area of the Japanese islands. As a result, surface gravity must have indicated not only coseismic changes but also long-term changes. In addition, secular changes due to the viscoelastic properties of the crust and the mantle may be observed in gravity recordings.

This earthquake is the first event in which three superconducting gravimeters (Mizusawa, Matsushiro and Kamioka) were in operation not far from the source region of an M9 class earthquake. Although these gravimeters suffered from severe disturbances due to the main shock and the aftershocks, they have been producing almost continuous recordings of gravity. As the data are accumulated, crustal deformations as seen from gravity may be revealed by long term gravity observations with the superconducting gravimeters. We are working on separation of the signals by making corrections for the atmospheric and hydrological effects on gravity.

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