

## Regional gravity field modeling from GRACE data for the vicinity of Japan -Preliminary results

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The Japanese islands and their vicinity are located in a trench and island arc region in which four tectonic plates converge, producing substantial gravity and geoid undulations in a wide range of wavelengths. Because of the geometry of the islands and trenches, precise information on gravity in the surrounding oceans should be incorporated in detail, even if the geoid model is required to be accurate only over land. The Kuroshio Current, one of the western boundary currents, runs south of Japan, causing high sea surface variability. Oceanographers, also, highly demand a precision absolute geoid model in the vicinity of Japan to enhance the ocean dynamics study in this area.

The latest gravimetric geoid model for Japan, JGEOID2004, was developed by combining land and marine gravity data with a global marine altimetric gravity model and with a global geopotential model, EGM96. Comparison with a nation-wide net of GPS at benchmarks shows that the geoid model contains smooth errors at long wavelengths in a range of +/-30 cm, presumably due to EGM96 errors.

To tackle with long wavelengths errors of the geoid model, we are investigating GRACE data for regional gravity field modeling at long wavelengths in the vicinity of Japan. First, precise science orbits determined from on-board GPS positioning data are used for calibrating accelerometer data. Second, inter-satellite range-rate data from GRACE with calibrated accelerometer data are processed for recovering the gravity field globally and regionally in the target area, with respect to a latest combined global geopotential model determined from GRACE and terrestrial gravity data, GGM02C. GEODYN2/SOLVE software developed at Goddard Space Flight Center, NASA of the U.S.A. is used for these procedures. Preliminary results for GRACE data obtained in the year 2003 are presented and discussed.