



CHANGES OF GRAVITY INFLUENCED BY WATER LEVEL FLUCTUATIONS, BASED ON MEASUREMENTS AND MODEL COMPUTATIONS

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More than 70% of the Earth's surface is covered by water. This huge mass of water is present in a wide variety of forms (e.g. in oceans, seas, lakes, rivers, polar ice caps, and as vapour, rainwater, ground water, etc.) The common property of different forms of water is that the state and momentary place of water masses induces the time variation of the Earth's gravity field. Effects of water masses to the gravity may be local, regional or global.

Measurements were carried out to determine the gravity effect of different changes of water masses. Gravity measurements were made at a few meters distance from the riverside at the biggest and smallest water levels of Danube in the days of big flood in 2002, another measurements were carried out directly above a drinking-water storage basin having the volume of 80000 cubic meters at strong fluctuations of water level, and test measurements were performed to examine time variation of gravity due to groundwater level changes. Two LCR-G gravimeters were applied for the relative gravity measurements and data of geophysical prospecting and groundwater level recordings were used for checking the measurements.

Gravity measurements were checked by model computations. Computations were carried out applying Bouguer-plate model on the one hand, and using FFT method for regular mass prism topographic model on the other hand.

Our results can provide useful viewpoints partly for planning the places of gravity network points, and can help for interpretation of the repeated absolute gravity

measurements for the sake of investigation of secular gravity variations.