



Experiences of new Eötvös torsion balance observations and reliability tests

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After more than 40 years of interruption new field observations have been made by an E-54 type torsion balance (TB) with visual readout. This original balance of the Eötvös Loránd Geophysical Institute was recently refurbished, and 15 TB stations have already been measured in the Csepel Island survey campaign in 2007 in addition to repeated measurements of two old stations that have measurements dated back to 1950. A detailed topographic survey of each measured station was also carried out. These TB measurements were accompanied by a detailed gravimetric survey of each station with LCR gravimeters at the same time. Both vertical (VG) and horizontal (HG) gravity gradients were determined at each TB station for VG interpolation and reliability tests.

We experienced an adverse effect of the observer's mass on the readings due to the sensitivity of the TB. This effect was captured with a video camera and its evaluation showed an effect of about 0.4 E (Eötvös) for 1.5 minutes readout time and also a rapid increase with time. To eliminate this effect we plan to modernize the instrument for automated reading. To reduce the thermal drift of the TB a new observation hut with improved thermal insulation is planned.

Vertical gradient of gravity cannot be measured directly by the Eötvös TB. However, we successfully interpolated VG differences in the network of TB measurements following the idea originally due to Haalck. Reliability tests by comparing HG and VG gravimetric and TB measurements were also performed. Our recent paper discusses first results of these field TB and gravimetric measurements which are to be continued in 2008 as well.