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Calibration results of different type spring gravimeters from the repeated measurements of Estonian calibration lines

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Rigorous calibration of relative spring gravimeter is always needed for obtaining reliable results from the terrestial gravimetric surveys. This study was based on the data of relative gravimeters, observed repeatedly since 2001 on several specially designated calibration lines in Estonia. The two types of gravimeters – LaCoste&Romberg (LCR) G-type (metal spring) and Scintrex CG5 (quartz spring) systems – were investigated in this study.
At first the calibration function of the gravimeter's manufacturer was used to convert the field gravity data into the centimetre-gram-second system (CGS) units. After the reduction of converted readings (corrected for the tides, atmosphere, observation elevation etc.), both the linear and nonlinear correctional components of calibration function were parameterized and estimated through the linearised least squares (LS) adjustment. The LS estimates were tested statistically and only the significant corrections of the calibration function were included to the subsequent data conversion.
As a result of the study, remarkably improved uncertainty estimations for the results collected with LCR-G (No 4, 113, 115, 191) and CG5 (No 36, 10092) gravimeters in Estonia are presented.