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最適な海洋潮汐モデル (TPXO7.2) で補正した重力潮汐ファクターによる FCR パラメータの計算
The estimation of FCR parameters by the gravimetric tidal factors corrected through optimal ocean tide model, TPXO7.2

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Superconducting gravimeters at Metsahovi, Strasbourg, Sutherland, Canberra and Syowa Stations were used to estimate the FCR (Fluid Core Resonance) parameters using the Bayesian method (Tarantola and Valette, 1982) with an priori information. We obtained the probability density function with the most probable value by integrating the probability for a reasonable parameter range (Florsch and Hinderer, 2000). One of the primary motivations of this study was to find the effectiveness of optimal ocean tide model for each station located globally on the estimated FCR parameters. From a statistical test on the error in K1, PSI1 and PHI1 waves, increasing the percentage error of the imaginary part of gravimetric factor in each wave separately, we found that the PSI1 wave was most sensitive to the correlation between the quality factor and imaginary component of the resonance strength, and to the standard deviation of quality factor. The ocean loading effect was estimated using TPXO7.2, which gave the smallest combined misfit for every station in diurnal bands. The obtained results are as follows: the quality factor of Metsahovi, Sutherland and Syowa stations were found to diverge, i.e., non-symmetric probability density functions (PDFs). The quality factor at Strasbourg and Canberra showed the symmetric PDFs and the most probable values by integration were 37762+-4452 and 3311+-607, respectively. Strasbourg was the only station which showed the good correlation between quality factor and imaginary part of resonance strength. Eigenperiods of 430+-5 and 428+-1.6 days at Metsahovi and Strasbourg, are close to the result of the theoretical prediction by Mathews et al. (2002) and the observed values at Europe by Rosat et al. (2009) within the margin of error. However, the results of eigenperiod of 435+-8 days for Sutherland, 432+-6 days for Canberra, and 433+-43 days for Syowa have discrepancies as compared with the most probable value of 430.2+-0.28 days by Mathews et al. (2002). Employing the stacking method, the parameters of FCR were found to have a normally distributed PDF: the mean values were 432+-2days for the eigenperiod, 0.6362+-0.006degree x10-3degree/ h for the real component of resonance strength, -0.1967+-0.0236degree x10-4degree/ h for the imaginary component of resonance strength, and 35897+-4230 for the quality factor.
Keywords: FCR parameters, ocean tide model, Superconducting gravimeter, Syowa Station, ocean loading effect