Geophysical Research Abstracts
Vol. 15, EGU2013-2933, 2013
EGU General Assembly 2013

Love numbers for the long-period tides estimated by VLBI

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Love and Shida numbers are proportionality factors characterizing the deformation of the anelastic Earth which arises as a response to external forces from the Moon and Sun. The increasing precision and quality of the Very Long Baseline Interferometry (VLBI) measurements allow determining those parameters. In particular, the long history of the VLBI data enables the estimation of Love and Shida numbers at the low frequencies of the tidal waves including the periods from 14 days to 18.6 years. In this study we analyse 27 years of VLBI measurements (1984.0 – 2011.0) following the recent IERS Conventions 2010. In several global solutions, we estimate the complex Love and Shida numbers of the solid Earth tides for the main long-period tidal waves. Furthermore, we determine the Love and Shida numbers of the rotational deformation due to polar motion, the so-called pole tide. We also focus on station displacement where still some deficiencies in the long-period signal modelling can be seen.