

Diurnal pole tides and determination of static and dynamic Love numbers from analysis of VLBI observations 1998-2001

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Simple analytical expressions to model diurnal oscillations in site displacements and in the coefficients c_2^1, s_2^1 of the geopotential caused by the centrifugal potential of the Earth's fluid core are derived. The amplitude of the largest tidal constituent $K1$ in the radial site displacements is determined from the analysis of VLBI observations of NEOS-A program 1998-2001 along with the Love numbers h_2 and l_2 . The estimated amplitude of the $K1$ term appears to be 19 ± 1 mm and statistically differs from the value 12.2 mm recommended by IERS Conventions (1996). This amplitude is proportional to the dynamic Love number h_2^d ; thus applying the derived analytical expression the estimate $h_2^d = 0.095 \pm 0.005$ follows. For the static Love numbers h_2, l_2 the estimates $h_2 = 0.6626 \pm 0.001, l_2 = 0.0922 \pm 0.0005$ are obtained. Some shortcomings of IERS Conventions concerning the diurnal tidal effects are discussed.