



Observation of the Earth liquid core resonance by extensometers

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The axis of the fluid outer core of the Earth and the rotation axis of the mantle do not coincide therefore restoring forces are set up at the core-mantle boundary which try to realign the two axes causing a resonance effect. In celestial reference system it is called the “Free Core Nutation” (FCN), which can be characterized by a period of 432 days while in the Earth reference system it is called the “Nearly Diurnal Free Wobble” (NDFW). The frequency of this phenomenon is near to the diurnal tidal frequencies, especially to P1 and K1 waves. Due to its resonance effect this phenomenon can be detected also by quartz tube extensometers suitable for Earth tides recording. In this study data series measured in several extensometric stations were used to reveal the presence of the FCN resonance. In the Pannonian Basin there are five observatories where extensometric measurements were carried out in different lengths of time. Four stations in Hungary: Sopronbánfalva Geodynamical Observatory (2000-2014), Budapest Mátyáshegy Gravity and Geodynamic Observatory (2005-2012), Pécs uranium mine (1991-1999), Bakonya, near to Pécs (2004-2005) and in Slovakia: Vyhne Earth Tide Observatory (2001-2013). Identical instrumentation in different observatories provides the opportunity to compare measurements with various topography, geology and environmental parameters. The results are also compared to values inferred from extensometric measurements in other stations.