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# A grand circumpolar quasigeostrophic westward current within the Earth's core?

**D. Jault** (1), N. Gillet (1) and A. Pais (2)

(1) LGIT, Joseph-Fourier University, Grenoble, France (Dominique.Jault@obs.ujf-grenoble.fr)
(2) Physics Department, University of Coimbra, Portugal

Assuming quasi-geostrophy within the Earth's fluid core and using the high precision SV model CHAOS (Olsen et al., 2006), we recently found indication of a grand westward current circling round the inner core. It touches the cylindrical surface tangent to the inner core from 135˚W to 150˚E and moves to larger radii in the Atlantic hemisphere in a band 30˚ away from the equator, from around 90˚E to 90˚W (Pais and Jault, 2008). Comparing velocity models calculated at three different epochs (2001, 2002.5, 2004), we found that this jet carries most of the time-varying part of the core angular momentum. We follow up the study of this jet and evaluate the flow of the circumpolar current as a function of longitude. We discuss what part of the observed SV can be attributed to the current. As our single epoch core flow models have smaller length-scales than previous flow models, it has been necessary to take into account iteratively the modelling errors resulting from the interaction between the calculated flow and the hidden small scale main field. However, the correlation in time of this hidden field implies that the modelling errors at different epochs are correlated also. Eventually, time changes of the circumpolar current will be known more accurately than the current itself. Finally, as the current touches the cylindrical surface tangent to the inner core (TC), it interacts with zonal motions just within (where radial motions are prohibited). We will use torsional oscillation models to discuss how these interactions depend on 1) equatorial asymmetry of the magnetic field at TC and 2) strength of the radial magnetic field at the inner core boundary.