

3.5.6.6 Special Bureau for the Core

Flow in the fluid outer core, and also motion of the inner core with respect to the outer core, can result in various geodetic phenomena observable from the Earth's surface or space. These phenomena include variations in the Earth's rotation and orientation, surface gravity changes, geocentre variations, and surface deformations. Although small, these variations can or could be observed by very precise space geodetic techniques. Observation of these effects yields unique insight into the core, which cannot be observed directly, and the resulting better understanding of the core will lead to improved models and predictions for the geodetic observables. The Special Bureau for the Core is responsible for collecting, archiving, and distributing data related to the core and plays a role in promoting and coordinating research on this topic. In particular, the SBC focuses on theoretical modelling and observations related to core structure and dynamics (including the geodynamo), and on inner core – outer core – mantle interactions. The SBC has about twenty members from the fields of geomagnetism, Earth rotation, geodynamo modelling (numerical and experimental), and gravimetry.

The SBC has set up a web site (<www.astro.oma.be/SBC/main.html>) as the central mechanism for providing services to the geophysical community. The web site presently contains nine different sets of model data on core flow and core angular momentum. The data are based on the observed surface geomagnetism field, and various hypotheses and physical assumptions are used to determine the flow and the angular momentum of the core. The core flows and angular momentum variations are all very similar and agree remarkably well with the observed decadal LOD variations. In addition to the data, a description is given of the relevant theories and of the dynamical assumptions used for constructing the flows.

A further goal of the SBC is to distribute general information on the core, to make the geophysical community aware of the various geodetic effects that could be linked with the core, and to stimulate, support and facilitate core research. We therefore present on our website concise explanations on topics as core convection, core flow, geomagnetism, core-mantle boundary torques, inner core differential rotation, Earth's rotation changes due to the core, and core composition. Additionally, we have built and continuously update a bibliography of articles relevant to the core that at present contains more than a thousand references.

Within the multidisciplinary spirit of the SBC, a book has been prepared by V. Dehant, K. Creager, S. Karato, and S. Zatman (eds.) and published in December 2002 by the American Geophysical

Society as “Earth’s Core: dynamics, structure, rotation”. In July 2002, the chair of the SBC was turned over from V. Dehant to T. Van Hoolst.

Members

Dehant, Veronique¹ (Chair until June 2002)

Van Hoolst, Tim¹ (Chair since July 2002)

and by alphabetic order

Cardin, Philippe²

Chulliat, Arnaud³

Defraigne, Pascale¹

de Viron, Olivier¹

Dormy, Emmanuel³

Greff-Lefftz, Marianne³

Hinderer, Jacques⁴

Holme, Richard⁵

Hulot, Gauthier³

Jackson, Andrew⁶

Jault, Dominique²

Kuang, Weijia⁷

Legros, Hilaire⁴

Le Mouél, Jean-Louis³

Noir, Jerome²

Pais, Alexandra⁸

¹ Royal Observatory of Belgium (ROB), Av. Circulaire 3,
B-1180 Brussels, Belgium

² Laboratoire de Géophysique Interne et Tectonophysique (LGIT)
de Grenoble, France

³ Institut de Physique du Globe de Paris (IPGP), Laboratoire de
Géomagnétisme, France

⁴ Ecole et Observatoire de Physique du Globe de Strasbourg
(EOPGS), France

⁵ University of Liverpool, United Kingdom

⁶ School of Earth Sciences, University of Leeds, United Kingdom

⁷ Goddard Space Flight Center (GSFC), USA

⁸ University of Coimbra (UMBC), Portugal

Tim Van Hoolst and Véronique Dehant