The LPO Iron Pattern beneath the Earth’s Inner Core Boundary

Maurizio Mattesini (1,2), Anatoly Belonoshko (3), and Hrvoje Tkalčić (4)
(1) Departamento de Física de la Tierra, Astronomía y Astrofísica I, Universidad Complutense de Madrid, E-28040 Madrid, Spain (mmattessi@ucm.es), (2) Instituto de Geociencias (UCM-CSIC), Facultad de Ciencias Físicas, Plaza de Ciencias 1, 28040-Madrid, Spain (m.mattesini@igeo.ucm-csic.es), (3) Condensed Matter Theory, Department of Theoretical Physics, AlbaNova University Center, KTH Royal Institute of Technology, SE-10691 Stockholm, Sweden (anatoly@kth.se), (4) Research School of Earth Sciences, The Australian National University, Canberra, 0200 Canberra, ACT, Australia (Hrvoje.Tkalcie@anu.edu.au)

An Earth’s inner core surface pattern for the iron Lattice Preferred Orientation (LPO) has been addressed for various iron crystal polymorphs. The geographical distribution of the amount of crystal alienation was achieved by bridging high-quality inner core probing seismic data [PKP(bc-df)] together with ab initio computed elastic constants. We show that the proposed topographic crystal alignment may be used as a boundary condition for dynamo simulations, providing an additional way to discriminate in between different and, often controversial, geodynamical scenarios.