



Irregularities and dynamics of the core-mantle boundary

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Models of the gravity and magnetic fields, over nearly a decade due to GRACE and CHAMP missions, have reached an unprecedented resolution and accuracy, allowing new insights in describing the core-mantle boundary phenomena and the core dynamics. There is indeed a striking contrast between the mantle and the core, and this frontier is expected to be the site of physical-chemical interactions between core and mantle. The hot liquid core can corrode the overlying mantle, preferentially dissolving the silicates and oxides along the grain boundaries and infiltrating upward into the mantle by capillarity. The core-mantle boundary does not move upward or downward as a whole, but acquires a roughness, invisible to the seismology, which has fractal properties. As a consequence, gravimetric anomalies can be generated by this relief and be noticeable, thanks to the new high-accuracy data, at the Earth's surface. Such a relief also exerts a pressure distribution at the core-mantle boundary which is accompanied by a flow at the top of the core; this flow generates an additional secular variation of the geomagnetic field, which might be observable at the Earth's surface.