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Small-Scale Motion in the Core of the Earth

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In 1996 St. Pierre reported numerical simulations of a buoyant blob migrating across the earth's outer core and subject to the combined effects of rotation and an azimuthal magnetic field. He noted that the blob rapidly fragments into a series of plate-like structures. Quite independantly, in the mid 1990's, Davidson discovered a similar behaviour in the context of low-Rm MHD turbulence (in which the Coriolis force is absent) and showed that this phenomenon has its roots in the destruction of angular momentum by the Lorentz force. In this lecture we pull together these earlier studies and show that they are closely related. The implications for the structure of the small-scale motion in the core of the earth are also discussed.

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