

Generation of MAC Waves by Convection in Earth's Core

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Convection in Earth's core generates long-period magnetic waves when the top of the core is thermally stratified. These waves can be detected in magnetic-field observations and the wave properties are used to recover quantitative estimates for the stratification. A description of the waves and wave generation is similar to the problem of acoustic-wave generation in stars, although the largest source of excitation is probably due to buoyant parcels rising into the stratified layer. The influence of inertial and magnetic forces are expected to be much smaller. Numerical dynamo models suggest that convection preferentially excites symmetric waves about the equator, which is compatible with the observations. Estimates of the strength and thickness of thermal stratification imposes tight constraints on the thermal evolution of the core.

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