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Origin of the Earth's magnetic field from the Fermi electrons

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Planetary magnetic field production mechanism may require consideration of fermi electrons. While avoiding the Boussinesq approximation and considering a presence of Fermi electrons in a planetary core, a new hypothesis how the planetary magnetic field may operate is proposed. The overall topology concerns both the core's north hemisphere (NH) and south hemisphere (SH) that produce its own magnetic polarities due to a sense of the Earth's rotation (Coriolis effect). Magnetism can be generated due to the electric current form the core's fermi electrons that follow the more conducting spiraling plumes from the convection heat exchange. NH produces magnetic flux directed toward the north (reversed polarity) while SH produces magnetic flux directed to the south (normal polarity). When NH is more buoyant than SH, the overall dipolar reversed polarity is produced. When SH of the core is more buoyant, the overall normal magnetic polarity is produced. Overall planetary magnetic field is then generated from a core's heat exchange competition between its NH and SH. For this hypothesis supports is found from the theoretical arguments, from the topology of finite element modeling, and from the evidence of a historical magnetic reversal record. Calculations considering the presence of Fermi electrons in the core allow for heat gradient generated magnetic flux estimate between 0.1 mT and 3 mT inside the liquid core. Finite element modeling topology of simulated magnetic dipoles near inner/outer core boundary (IOB) oriented only northward in NH and southward in SH supported that todays' surface magnetic field observations are consistent with the outer core fields between 0.1 mT and 3 mT. Individual treatment of normal and reversed polarity durations supported that a predominance of magnetic polarity durations relates to the existing temperature models near the core/mantle boundary (CMB) that have a consistent effect on the heating exchange within the core.