EPSC Abstracts,
Vol. 4, EPSC2009-688, 2009
European Planetary Science Congress,

A magnetic field evolution scenario for brown dwarfs and giant planets

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Abstract

Astrophysical dynamos that are governed by convective motion may follow a general rule connecting magnetic field generation in stars, brown dwarfs, and planets. For the case of rapid rotation, Christensen et al. have recently proposed a scaling law for the magnetic field strength that allows to estimate the magnetic field strength for giant extrasolar planets. We present the results from this relation for a number of known exoplanetary systems. From the predicted average magnetic fields, we estimate intensitiy and peak frequency for the radio-flux.