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## Coupled macro-spin models for polarity reversals — earth, sun, and planets —

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We propose a coupled macro-spin model to describe magnetism and its polarity reversals of the earth, the sun and the planets in this talk. This model is based on the idea that the whole dynamo mechanism is described by global interactions of many small dynamo elements. This is the minimal model to elucidate the essence of the polarity reversal dynamics described by the complicated magneto-hydrodynamics equations.

This simple model naturally yields many of the observed features of geomagnetism: its time evolution, the power spectrum, the frequency distribution of stable polarity periods, etc. In case of the earth, the dynamo element, that a macro-spin describes, is considered to be the Tayler cell in the iron fluid core produced and supported by the Coriolis force.

Keywords: geomagnetism, dynamo, scaling, coupled-spin, solar magnetism