



A 50 years core magnetic field model under frozen-flux constraints

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One possible method for imposing the frozen-flux approximation to a core magnetic field model, is to co-estimate the field and a flow model at the top of the liquid outer core. The flow model is, in this approach, derived through the radial diffusion-less induction equation. It has been shown that the technique works remarkably well on seven years of CHAMP satellite data: An accurate magnetic field model has been obtained while constraints were applied exclusively on the flow. Although, during this seven years covered by the CHAMP data set, rapid time variations of the SV have been observed, none have an obvious global signature. Therefore, it is not clear if these variations are geomagnetic jerks. We apply the same technique on a observatory data set made of 50 years of SV estimates (1957.0 to 2006.4). The model is also constrained to fit models derived from satellite data in 1980.0 and 2004.0. Our goal is three folds:

- 1- Verify that the technique employed does not fail on long time period.
- 2- Verify that the known jerks can be explained in the framework of the frozen-flux approximation.
- 3- Derive a core field and a flow models, at the CMB, that can help understanding the mechanism associated with jerks.

Preliminary results will be presented.