

GEOMAGNETIC FIELD HEMISPHERIC ASYMMETRY AND ARCHEOMAGNETIC JERKS

Yves Gallet¹, GAUTHIER HULOT², Arnaud Chulliat², Agnès Genevey³

¹ Equipe de Paléomagnétisme, Institut de Physique du Globe de Paris, France

² Equipe de Géomagnétisme, Institut de Physique du Globe de Paris, France

³ Centre de Recherche et de Restauration des Musées de France, Paris, France

We investigate the origin of the so-called archeomagnetic jerks detected in the French archeomagnetic record over the past three millennia. Although only very large-scale global archeomagnetic field models are currently available, we show that the occurrence of archeomagnetic jerks is intimately linked to what we define as “most eccentric” events, i.e., periods of time when a simple description of the geomagnetic field in terms of an eccentric dipole reveals the center of this eccentric dipole to strongly move away from the Earth’s center. From the behavior of the much better known historical field, we interpret the evolution of the center of the eccentric dipole as reflecting the production and gathering of flux patches at the core-mantle boundary within preferential hemispheres. Archeomagnetic jerks would thus correspond to episodes of maximum geomagnetic field hemispheric asymmetry. Such “most eccentric” events could also provide an explanation for some of the properties previously reported in the long-term paleomagnetic field.

Archeomagnetism, Secular Variation

Gauthier Hulot, Equipe de Géomagnétisme, Institut de Physique du Globe de Paris, 4 place Jussieu, 75252 Paris cedex 05, France, e-mail: gh@ipgp.jussieu.fr