

Determination of Lunar Paleo Pole Positions Using Apollo and Lunar Prospector Data Magnetometer Data

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Lunar paleomagnetic poles position determined using Apollo and Lunar Prospector magnetometer data are presented. The Apollo magnetometer data used here are those selected by Hood et al., 1981. Concerning Lunar Prospector's data only measurements at low altitudes are taken. The method used to separate the internal and external signals of Lunar Prospector magnetometer data is described by Berguig et al., 2005. So anomalies detected by both magnetometer and reflectometer instruments are then used to be inverted to determined paleopoles directions. Our mapping of lunar magnetic anomalies at satellite altitudes is coherent with those done using different techniques [Hood et al., 2001] and the Apollo and Lunar Prospector data [Lin et al., 1998; Hood et al., 1981]. The strongest magnetic anomalies obtained with our selection methods are located at the antipodes of young impact basin such as Imbrium, Serenitatis Crisium and Orientate, which exceed 30 nT. These studies show that no evident correlation has been observed between magnetic anomalies and either geology or lunar topography. The random positions of paleomagnetic pole directions determined using an equivalent dipole source method (Purucker et al., 2000) suggest that the lunar remanent magnetization were since modified by subsequent impact events (Halekas et al., 2002). Then the paleo pole positions are calculated using ideal magnetic bodies for modelling lunar Imbrian magnetic strongest anomalies such as Reiner Gamma and Descartes anomalies (showed first by Richmond et al., 2003). The paleo poles found by inverting the data over these two regions are similar in directions. Also, earlier Results from Runcorn (1988) using lunar samples are also coherent with our preliminary models of paleo magnetic field. The results of two inversions methods are in favour of lunar remanent magnetization acquired by a global dipole field and were since modified by subsequent impact events.