



## Validate Mapping of Internal Lunar Magnetic Field

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In this work we present a global mapping of vector lunar magnetic field based on new method of separation of internal and external fields using inversion. The magnetic measurements collected during the lifetime of Lunar Prospector (LP) extended mission during 1999 were strongly disturbed by the solar wind, a period which coincided with a maximum of the 23 cycle activity. The multi scale wavelength external fields were analyzed using spherical harmonic transform. The external field determined by inversion was then removed from each magnetic field component for each half orbit. To map the vector magnetic crustal anomalies, all LP magnetometer data collected at low altitudes in the three different lunar environments: (1) geomagnetic tail (2) solar wind (3) geomagnetic sheath, were processed using this new approach. The results obtained using these selection criteria allow us to get a global coverage of the lunar surface by the vector magnetic field at variable spacecraft low altitudes. To validate our mapping we have developed and applied a method based on properties of potential fields functions. This method can be used to determine both horizontal North and East components using only vertical component. The validate lunar internal magnetic measurements obtained at variable spacecraft altitudes was then continued to a common altitude of 30 km using non linear inverse methods. This mapping confirm firstly the nature of the crustal sources of lunar magnetic field and clearly shows that the strongest concentrations of anomalies are associated with of high albedo and/or located antipodal to large young basins (Orientale, Serenitatis, Imbrium, and Crisium) of age about 3.9 Ga.