

Paleomagnetic poles of the early Moon estimated from small isolated magnetic anomalies

*Yuma Ikeuchi¹, Hideo Tsunakawa¹, Futoshi Takahashi²

1.Department of Earth and Planetary Sciences, Tokyo Institute of Technology, 2.Department of Earth and Planetary Sciences, Kyushu University

Paleomagnetic measurements and satellite observations indicate that the global magnetic field existed in the early Moon, in probable, a core dynamo field. Using the Kaguya and Lunar Prospector observations at 20-40 km altitudes, Takahashi et al. (2014) estimated magnetization directions for 24 lunar magnetic anomalies, suggesting the polar wandering of the early Moon. Although they applied a dipole approximation, the observations at high altitudes are generally affected by the crustal field at relatively wide area. Thus their estimation includes some ambiguity of the dipole approximation. In the present study, we use the global maps of the lunar magnetic anomalies on the surface with the Surface Vector Mapping (SVM) method [Tsunakawa., et al. 2015]. The SVM data with high spatial resolution are useful for finding small isolated anomalies like a single dipole. As a result, we have selected several tens of magnetic anomalies to be approximated with a single dipole source. The magnetic poles in the present analysis show two main clusters: one is near the selenographic north pole and the other is on the eastern hemisphere.

Keywords: Moon, magnetic anomaly, paleomagnetic pole