Polarimetric Measurements of Apollo Soil Samples by Particle Size

Serin Kim[1], Shuai Li[2], Minsup Jeong[3], Young-Jun Choi[3], **Kilho Baek**[1], Sungsoo S. Kim[1], Eunjin Cho[4]

[1] *Kyung Hee University*
[2] *University of Hawaii at Manoa*
[3] *Korea Astronomy and Space Science Institute*
[4] *Chungnam National University*

Polarization properties of the moon include information of lunar soil such as grain size and composition. Polarization phase curves offer the polarization properties but there is a lack of related research and laboratory experiments using lunar samples. For this reason, we performed polarimetric measurements of Apollo soil samples at various phase angles (15, 20, 25, and 100 degrees) in three bands (B, V, and R). A total of five Apollo samples were used: two Apollo 14 samples (14163 and 14260) and three Apollo 16 samples (61141, 61221, and 65701). The samples were sieved to different size groups (<25, 25–45, 45–90, and 90–150 μm) including the bulk group (<150 μm). We investigate the correlation between the grain sizes and degree of polarization and their wavelength dependence. Also, we examine the negative branch within the phase angle range of 15° to 25°. In the negative branch, minimum polarization and inversion angle are measured to study their relationship to the grain size and single-particle scattering.