Analysis of Spectral Difference between Crater Floors and Halos

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The lunar surface is exposed to meteoroid bombardment and solar wind particles, being physically and chemically affected. The micrometeoroids and energetic particles create tiny metallic iron particles within the lunar soils. The impact of various-sized meteoroids not only pulverizes the surface materials but also creates craters by excavating subsurface materials and transforming minerals through the melting process. Although the crater materials were simultaneously exposed at the surface, the crater floor, halo, and ejecta show optical and spectral differences. In this study, we analyze the UV reflectance and a few space weathering parameters using VIS-NIR reflectance to compare the floors and halos in dozens of Copernican and Eratosthenian craters. We also compare the thermophysical properties of the floors and halos by using the observed surface temperature and a thermal model. This study will enhance our understanding of the crater materials.