

Exploring stable lithium isotope (δ^7Li) concentration on the lunar surface.

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Abstract

We explore the concentration of Lithium and δ^7Li in the lunar surface (out rocks and regolith) using spectral data obtained from the Clementine mission (images UV-VIS with 450, 750, 900, 950 and 1000 nm bands), that provide 100 % coverage of the lunar surface at resolution of 100 to 300 m, between latitudes of 70° S to 70° N. In order to extract quantitative abundance of Lithium, ground truth sites must be used to calibrate the sensor. Lithium composition of samples (12045, 15058, 15475, 15555, 70035, 74220 and 75075) returned from Apollo missions 12, 15, 16 and 17 have been compared to the Clementine UV-Vis-Nir bands. We find an excellent linear correlation between the spectral parameters and Lithium content of samples. The analysis presented here further explores the presence of Lithium and δ^7Li in areas with different exposures to solar wind, as shadowed craters or elevated areas of lunar crust with different exposure age, trying to elucidate the possibility of Lithium enrichment of lunar regolith by spallation processes.