

Abstract Submitted
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Use of Multivariate Analysis Techniques to Form a Comparison of Mars Odyssey Gamma Ray Elemental Data to Neutron Data¹ PAUL ABBAZIA, Department of Physics and Astronomy, Rowan University — The Lunar Reconnaissance Orbiter's (LRO) primary mission is exploration. Additional science falls to a secondary focus. LRO does not possess a gamma ray spectrometer, but it has the collimated neutron detector LEND (Lunar Exploration Neutron Detector). It is of interest to determine as much as possible about the moon's elemental composition using LEND. To do so, data from a similar instrument on Mars Odyssey, HEND (High Energy Neutron Detector), was compared to data from Mars Odyssey's gamma ray spectrometer (GRS). Elemental maps were previously derived from the GRS data, and a relation to HEND would allow for LEND to fulfill this role on LRO. Toward this purpose, different multivariate analysis techniques were used to compare GRS and HEND data, including Principal Components Analysis (PCA), K-means clustering, and Pearson product-moment correlation. Results indicate that two elements well known to effect neutron counts, hydrogen and iron, can be identified by these techniques. Further analysis may find additional relations, which would have benefits to the fields of geochemistry and neutron spectroscopy.

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