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Crater Age and Hydrogen Content in Lunar Regolith from LEND Neutron Data

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We are presenting an analysis of Lunar Exploration Neutron Detector (LEND) epithermal neutron count rates for a large set of mid-latitude craters. Epithermal neutron count rates for crater interiors measured by the LEND Sensor for Epithermal Neutrons (SETN) were compared to crater exteriors for 322 craters. An increase in relative count rate at about 9-sigma confidence level was found, consistent with a lower hydrogen content. A smaller subset of 31 craters, all located near three Copernican era craters, Jackson, Tycho, and Necho, also shows a significant increase in Optical Maturity parameter implying an immature regolith. The increase in SETN count rate for these craters is greater than the increase for the full set of craters by more than a factor of two.