

WHICH SPOT on the MOON has the HIGHEST CONTENT of HYDROGEN? A.B Sanin¹, I.G. Mitrofanov¹, M.L. Litvak¹, V.I. Tretyakov¹, A.S. Kozyrev¹, A.V. Malakhov¹, M.I. Mokrousov¹, A.A. Vostrukhin¹, D. V. Golovin¹, A.B. Varenikov¹, V. N. Shvecov², W.V. Boynton³, K Harshman³, R.Z. Sagdeev⁴, G. Milikh⁴, G. Chin⁵, J. Trombka⁵, T. Mcclanahan⁵, R. Starr⁶, L. Evans⁷, V. Shevchenko⁸, ¹Space Research Institute, RAS, Moscow, 117997, Russia, sanin@mx.iki.rssi.ru, ²Joint Institute for Nuclear Research, Dubna, Russia, ³University of Arizona, Tucson, AZ, USA, ⁴University of Maryland, College Park, MD, USA, ⁵Goddard Space Flight Center, Greenbelt, MD, USA., ⁶Catholic University, Washington, DC, USA, ⁷Computer Sciences Corporation, Glenn Dale, MD, USA, ⁸Sternberg Astronomical Institute of Moscow State University, Moscow, Russia.

Introduction: In this analysis we have used the data gathered by the Lunar Exploration Neutron Detector (LEND) installed onboard Lunar Reconnaissance Orbiter (LRO) [1-3]. LEND is a collimated neutron spectrometer of epithermal and fast neutrons with spatial resolution about 10-20 km. One of the LEND primary goals is mapping/testing hydrogen (as possible water ice deposits) content at the permanently shadowed craters at the lunar poles. LEND started onboard measurements in June 2009 during LRO commissioning phase and successfully continues it during primary mapping phase.

Data Analysis: Here we used LEND data from commissioning and mapping phase to create southern polar map of hydrogen rich areas to detect candidates to be most “wet” spots on Moon. We also plan to make comparison of these hydrogen rich locations with temperature, albedo, altimetry data (all data sets are available from the other science instruments onboard LRO) and to correlate it with known polar shadow regions and its vicinities.

[1] Mitrofanov I.G. et al. (2008) Experiment LEND of the NASA Lunar Reconnaissance Orbiter for High-Resolution Mapping of Neutron Emission of the Moon, *Astrobiology*, Volume 8, Issue 4, pp. 793-804

[2] Mitrofanov, I.G. et al. (2010) Lunar Exploration Neutron Detector for the NASA Lunar Reconnaissance Orbiter, *Space Science Reviews*, Volume 150, Issue 1-4, pp. 183-207, 2010

[3] Chin G (2007) Lunar Reconnaissance Orbiter Overview: The Instrument Suite and Mission, *Space Science Reviews*, Volume 129, Issue 4, pp.391-419

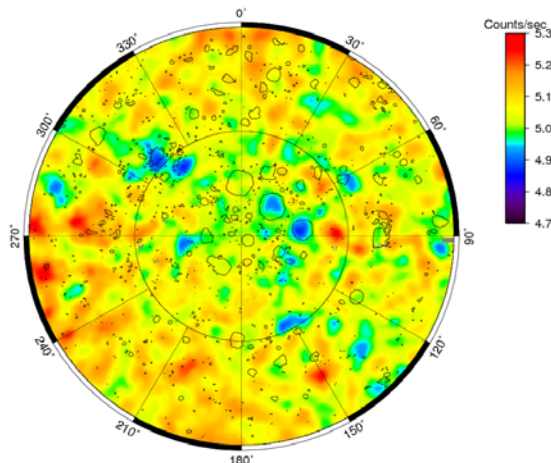


Figure 1. Preliminary map of epithermal neutron flux in southern polar region. Blue regions correspond to the best southern candidates of spots with the highest content of Hydrogen on the Moon

References: