

IAF SPACE EXPLORATION SYMPOSIUM (A3)
Moon Exploration – Part 2 (2B)

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NEUTRON DETECTOR FOR SURFACE MAPPING OF LUNAR WATER

Abstract

A current renaissance of lunar exploration enables to search for lunar water deposits directly on the surface of the Moon with robotic rovers. We present a miniature detector capable of mapping the water deposits using non-invasive detection of neutrons created underground by cosmic rays and thermalized by hydrogen. This device consists of a cosmic radiation detector to monitor the background, a thermal neutron detector to measure flux of neutrons moderated by water, and a gamma spectrometer to analyze elemental composition of the lunar regolith. The detector is being developed for 2023 iSpace lunar mission and is based on Timepix pixel sensors, which are already space-proven through our devices onboard NASA, ESA and JAXA vessels.