The Lunar Lander Neutron & Dosimetry (LND) Experiment on Chang'E4.

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Despite the aim of landing humans on the Moon in the not too distant future, the current knowledge about the radiation environment on the surface of the Moon is based exclusively on calculations using radiation transport models with input parameters from models for the galactic cosmic ray spectra and for solar particle events.

Chang'E4 is the next Chinese mission to the Moon and is planned to launch in December 2018 and to land on the far side of the Moon in the South Pole Aitken Basin. The mission consists of a lander, a rover, and a communication relay. Here we describe the Lunar Lander Neutron & Dosimetry experiment (LND) which will be placed on the lander. It consists of a stack of 10 segmented Si solid-state detectors (SSDs) which forms a particle telescope to measure charged particles (electrons 150-500 keV, protons 12-30 MeV, and heavier nuclei 15-30 MeV/nuc). A special geometrical arrangement allows observations of fast neutrons (and γ-rays) which are also important for dosimetry and cosmic-ray exposure of lunar soils. Thermal neutrons are measured using a very thin Gd conversion foil which is sandwiched between two SSDs. Thermal neutrons are sensitive to subsurface water and important to understand lunar surface mixing processes.