

## FACILITY for GROUND TESTS with ACTIVE NEUTRON INSTRUMENTATION for the PLANETARY SCIENCE MISSIONS

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To conduct a feasibility study of active neutron and gamma spectrometers a special radiation test facility has been developed and built at the Joint Institute for Nuclear Research (JINR) in Dubna, Russia. It has total area of about 62 m2 and with height from floor to roof up to 3.5 m. To provide measurements with prototypes of space instruments developed for the nuclear planetology applications and to test capabilities of such instruments we have designed and constructed special soil targets similar to planetary material with known elemental composition, appropriate geometry and layered structure. Here we also present results of first experimental work performed with a spare flight model of the DAN/MSL instrument selected as a flight prototype of an active neutron spectrometer applicable for the future landed missions to various solid solar system bodies. In our experiment we have tested the capability of neutron activation methods to detect thin layers of water/water ice lying on top of planetary dry regolith or buried within a dry regolith at different depths.