

The Impact of LUNA Results on Astroparticle Physics

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LUNA (Laboratory for Underground Nuclear Astrophysics) is devoted to measure nuclear cross sections relevant in astroparticle physics. The LUNA facility operates underground, at the "Laboratori Nazionali del Gran Sasso" (LNGS), where the measurement of nuclear cross sections at very low energies is possible due to the fact that the Gran Sasso mountain provides a huge reduction of the background induced by cosmic rays. LUNA yields a solid experimental base for the Standard Solar Model, that is of primary importance in the study of the Sun and in the neutrino physics. Many reactions studied by LUNA are very important to study other celestial bodies and their evolution. Finally, LUNA provides the measurement of cross sections of several leading processes in the Big Bang Nucleosynthesis. The comparison between the direct observation of light isotopes and their calculated abundance, allows an important test for the BBN theory, for the Standard Model and for the evolution of the universe. The results obtained by LUNA in the past and the future measurements are discussed.