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The study of 6Li(p, g)7Be reaction at LUNA

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The 6Li(p, g)7Be reaction is involved in several astrophysical scenarios such as the Big Bang Nucleosynthesis, ^{6}Li destruction in pre-main and in main sequence stars and solar neutrino production.
A recent direct measurement of the $6Li(p, gamma)7Becrosssectionfoundaresonance-likestructureatEc.m.=195keV, correspondingtoaE${x}\sim\,$5800 keV excited state in 7Be. This result has not been confirmed neither by other direct measurements nor by theoretical calculations {Barker, Ar, Prior, Dong}
In order to clarify the existence of this resonance a new experiment was performed at the Laboratory for Underground Nuclear Astrophysics (LUNA), located under 1400 m of dolomite rocks of Gran Sasso. Thanks to the extremely low background environment the 6Li(p,gamma)7Be cross section can be measured down to low energies with unprecedented sensitivity. The high intensity proton beam from the LUNA400kV accelerator was delivered to 6Li evaporated targets of different composition and thickness. To detect the gamma rays from the 6Li(p,gamma)7Be a HPGe detector was mounted in close geometry. A silicon detector was also used in order to have a simultaneous detection of charged particles from the 6Li(p,alpha)3He channel. Target characterization was performed at the Helmholtz Zentrum Dresden Rossendorf in Dresden using two independent Ion Beam Analysis techniques: Nuclear Reaction Analysis and Elastic Recoil Detection Analysis.
The talk will provide a detailed description of the experimental setup. In addition preliminary results will be reported.

References
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