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Underground Measurement of Proton-Induced Reactions on ${}^6\text{Li}$ at LUNA

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Proton-induced reactions on ${}^6\text{Li}$ play an important role in nuclear astrophysics studies in relation to primordial lithium abundances. Whilst big bang nucleosynthesis theory excludes the existence of “primordial” ${}^6\text{Li}$, the ${}^6\text{Li}/{}^7\text{Li}$ abundance ratio observed in pre-main sequence (PMS) stars is ~ 0.5 . The ${}^6\text{Li}(p,\alpha){}^3\text{He}$ and ${}^6\text{Li}(p,g){}^7\text{Be}$ reactions are the main processes that contribute to ${}^6\text{Li}$ destruction in stars. Both reactions were recently studied at LUNA via proton bombardment of ${}^6\text{Li}$ -enriched targets, with complimentary target composition studies performed at HZDR. Improvements on the precision of the low-energy S-factor values are expected from this study. Notably, the low-background measurement at LUNA will assist the search for a recently observed ${}^6\text{Li}(p,g){}^7\text{Be}$ low energy resonance proposed at $E_r \sim 195\text{keV}$. In this talk I will introduce the LUNA experimental setup and present preliminary results of the ongoing analysis.

Selected session

Nuclear Astrophysics

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