

Study of the ${}^3\text{He}(\alpha,\gamma){}^7\text{Be}$ reaction at Dresden Felsenkeller

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A key reaction in both Big-Bang nucleosynthesis (BBN) and p-p-chain hydrogen burning is the ${}^3\text{He}(\alpha,\gamma){}^7\text{Be}$ reaction. The aim of the present study is a comprehensive data set covering the entire BBN range. In a first campaign, γ -ray angular distributions have been measured at the 3 MV Tandetron accelerator of Helmholtz-Zentrum Dresden-Rossendorf (HZDR) with implanted ${}^3\text{He}$ targets. Activated samples of ${}^7\text{Be}$ (≈ 53 d half-life) have been counted at the shallow-underground laboratory Dresden Felsenkeller using a new 150% HPGe detector shielded from cosmic rays by ultra-low background copper and lead, active plastic scintillation veto detectors and 140 m water equivalent of rock. A second campaign is planned underground at the new 5 MV Pelletron accelerator Dresden Felsenkeller with a currently designed gas target that can be operated as an extended gas chamber or as a gas jet. Preliminary results of the angular distribution and activation data from the first campaign will be presented as well as the latest status of the Felsenkeller gas-target setup.