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Experimental cross section of the ^{3}He(α,γ)^{7}Be reaction around $E_{\mathrm{cm}} = 3\,\mathrm{MeV}$

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The $^3\mathrm{He}(\alpha,\gamma)^7\mathrm{Be}$ reaction plays a major role both in the big bang nucleosynthesis (BBN) where it affects the primordial ^{7}Li production, and in the solar energy generation via the pp-chain where as a branching point it affects the flux of neutrinos. Precise understanding of the reaction mechanism is of crucial importance for BBN and solar model calculations.

In case of the energy range relevant in the BBN, there are few experimental datasets, however in the solar relevant energy range it is impossible to measure experimental cross sections. For the solar models, one has to rely on extrapolation from higher energy datasets.
To aid these extrapolations, in the present study the reaction cross section was measured in the energy range covered so far with only one experimental dataset. The well known activation technique was employed, using a thin-window gas cell target containing ^{3}He gas. The irradiations were performed by the cyclotron accelerator of Atomki. The γ-photons following the decay of the reaction products were detected with high purity germanium detector.

Details of the experiment and preliminary results will be presented along with a literature overview of the reaction and future plans to pinpoint crucial unknowns regarding this important reaction.

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