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Cross section measurement of the astrophysically important $^{17}\text{O}(p,g)^{18}\text{F}$ reaction with the activation method

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The $^{17}\text{O}(p,g)^{18}\text{F}$ reaction is one of the most important reactions of astrophysical interest. In general the hydrogen burning of oxygen isotopes can occur in hydrogen core and shell burning, asymptotic giant branch (AGB) stars during hydrogen shell burning, intermediate-mass AGB stars during hot-bottom burning, and both CO and ONe classical novae during explosive hydrogen burning [1]. This particular reaction is a corner stone of the CNO-III and CNO-IV cycles that occurs mostly at massive stars. Due to its astrophysical importance it is necessary to improve upon the existent data about this reaction, especially at higher energies where only one experimental dataset is available [2]. The experiment is in progress at the new tandemron accelerator at the Atomki institute in Debrecen, Hungary, where targets of Ta₂O₅ were activated with a proton beam in the 500 keV to 2 MeV energy interval. In this work we shall present preliminary results for the cross section of the $^{17}\text{O}(p,g)^{18}\text{F}$ reaction.

[1] A. Coc et al., Eur. Phys. J. A 51, 34 (2015).

[2] C. Rolfs, Nucl. Phys. A 217, 29 (1973).

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