Indirect study of the $^3He(n,p)^3H$ reaction at cosmological energies

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One of the cornerstones of the Big Bang cosmological model is the Big Bang nucleosynthesis (BBN). A series of 12 reactions converts the initial protons and neutrons into helium isotopes and a very small, although very important amount of ^7Li. In this network of reactions, the $^3He(n,p)^3H$ has an important role which impacts the final ^7Li abundance. The Trojan Horse Method (THM) has been applied to the $^3He(d,pt)H$ reaction in order to extract the astrophysical $S(E)$-factor in the Gamow energy range. The experiment was performed thanks to Notre Dame Tandem of the Physics and Astronomy Department of the N.D. University (USA). In this poster the experimental setup will be described together with the first preliminary result.