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$d(\alpha,\gamma)$ REACTION MEASUREMENT AT LUNA

The amount of ${}^6\text{Li}$ produced during the Big Bang Nucleosynthesis (BBN) era can be theoretically estimated on the basis of cosmological and nuclear astrophysics knowledge [1]. The latter strongly depends on the measurement of the nuclear cross section of the processes involved in the production and destruction of ${}^6\text{Li}$ during the first stages of the Universe. Whereas the destruction process cross sections are well known [2], the reaction that dominates the ${}^6\text{Li}$ production, the ${}^2\text{H}(\alpha,\gamma){}^6\text{Li}$, has never been directly measured in the BBN energy range and only upper limits coming from indirect measurements are available till now [3]. Here we report the first direct measurement of the ${}^2\text{H}(\alpha,\gamma){}^6\text{Li}$ cross section at BBN energies obtained at LUNA (Laboratory for Underground Nuclear Astrophysics, LNGS, Italy).

[1] C. Iliadis, Nuclear Physics of Stars (Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim, 2007).

[2] K. M. Nollett et al., Phys. Rev. C 56, 1144 (1997).

[3] F. Hammache, Phys. Rev. C 82, 065803 (2010).

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