Primordial ^{7}Li abundance and the role of the ^{7}Be(d,p)2α reaction*

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Using the recent very precise value of the baryonic density of the Universe [1] and the rates of the reactions involved in the standard Big Bang nucleosynthesis from a new compilation [2], we have deduced the light element (D, ^{3}He, ^{4}He, ^{7}Li) primordial abundances and compared them with spectroscopic observations [3]. We found an important discrepancy between the deduced ^{7}Li abundance and the one observed in halo stars of our Galaxy, supposed, until now, to represent the primordial abundance of this isotope. The origin of this discrepancy, observational, nuclear or more fundamental remains to be clarified. Here, we have considered the possible role of the up to now neglected ^{7}Be(d,p)2α reaction. We have investigated this reaction for the first time at energies appropriated for the Big-Bang environment using a radioactive ^{7}Be beam and a $(CD_2)_n$ self-supporting target at the CYCLONE radioactive beam facility at Louvain-la-Neuve, Belgium [4]. The experimental method is briefly described. Results and consequences for primordial nucleosynthesis are discussed.

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