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# Time-Reversal Measurement of the p-Wave Cross Sections of the ^{7}Be(n,α)^{4}He Reaction for the Cosmological Li Problem

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## Abstract

The cross sections of the ^{7}Be(n,α)^{4}He reaction for p-wave neutrons were experimentally determined at E_{c.m.}=0.20-0.81 MeV slightly above the big bang nucleosynthesis (BBN) energy window for the first time on the basis of the detailed balance principle by measuring the time-reverse reaction. The obtained cross sections are much larger than the cross sections for s-wave neutrons inferred from the recent measurement at the n_TOF facility in CERN, but significantly smaller than the theoretical estimation widely used in the BBN calculations. The present results suggest the ^{7}Be(n,α)^{4}He reaction rate is not large enough to solve the cosmological lithium problem, and this conclusion agrees with the recent result from the direct measurement of the s-wave cross sections using a low-energy neutron beam and the evaluated nuclear data library ENDF/B-VII.1.

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