Contribution ID: **16** Type: **Oral**

The cosmologically relevant 7Be(n,alpha)4He reaction in view of the recent THM investigations

Wednesday, 27 June 2018 10:30 (15 minutes)

The role of the unstable 7Be during the early epoch of the Big Bang Nucleosynthesis is currently matter of study in view of the long-standing 7Li cosmological problem [1]. Recently, the Trojan Horse Method (THM) [2] have been applied for measuring the cross section of the (n,alpha) reaction channel on 7Be by means of charge-symmetry hypothesis applied to the previous 7Li(p,alpha)4He THM data corrected for Coulomb effects. The deduced 7Be(n,alpha)4He data overlap with the Big Bang nucleosynthesis energies and the deduced reaction rate allows us to evaluate the corresponding cosmological implications [3].

References
[1] C. Bertulani & T. Kajino, Progress in Particle and Nuclear Physics 89, 56 (2016)
[2] R.E. Tribble et al., Report on Progress Physics 77, 106901 (2014)
[3] L. Lamia et al., The Astrophysical Journal 850, 175 (2017)

Summary

The destruction (n,a) channel on the unstable 7Be isotope has been matter of recent studies. Although several efforts have been made to cover the Big Bang energy range (namely about 100 keV) some discrepancies still exist between the different data set. For such a reason, charge symmetry hypothesis have been recently applied to the THM data on 7Li(p,a)4He thus allowing for determining the 7Be(n,a) cross section by means of the same data set. The results of such investigation have been published in Lamia L. et al., ApJ 2017 and will be the subject of the talk.

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Session Classification: Cosmology and big bang nucleosynthesis

Track Classification: Cosmology and big bang nucleosynthesis