Contribution ID: **9** Type: **Invited (online)**

The ^{7}Be + d reaction in the context of the cosmological lithium problem

Friday 2 December 2022 14:00 (25 minutes)

In nuclear astrophysics, the cosmological lithium problem is widely studied. However, the serious anomaly of around three times in the observed ^{7}Li abundance, as compared to the big-bang nucleosynthesis theory is unsolved for decades. Recent revisit to the problem searched for resonances in the destruction channel ^{7}Be + d. We carried out the measurements of relevant resonances in the ^{7}Be(d,p)^{8}Be* channel at HIE-ISOLDE [1]. The theoretical calculations normalized to the present data and extrapolated to Gamow energies, give an estimate of the contributions of excitations in the (d,p) channel. Inclusion of the 16.63 MeV state leads to a maximum S factor of 167 MeV b as compared to the earlier value of 100 MeV b. However, even the maximum S factor would reduce the primordial Li abundance by less than 1%, and thereby fail to solve the discrepancy. In addition, the measurement of the ^{7}Be(d,^{3}He)^{6}Li reaction shows that its effect on the Li anomaly is negligible. This apparently calls for new physics to address the problem.

[1] Sk M. Ali *et al*, Phys. Rev. Lett. 128, 252701 (2022)

Primary author: GUPTA, Dhruba (Bose Institute (IN))

Presenter: GUPTA, Dhruba (Bose Institute (IN))

Session Classification: Nuclear Astrophysics and Exotic Decays