Contribution ID: **34** Type: **Experimental Nuclear Physics**

Direct measurement of astrophysical S(E) for the 9Be(p,a)6Li and 9Be(p,d)8Be reactions at low energy

Saturday, 20 August 2022 14:15 (15 minutes)

The p-9Be reactions play a key role in accurate prediction of primordial abundance of beryllium, and its abundance can be used to exquisitely probe the nucleosynthesis and mixing mechanism of stars. In the present work, astrophysical S(E) factors of the 9Be(p,d)8Be and 9Be(p,α)6Li reactions have been obtained from thick-target yield Yield(Ei) for proton energies from 18 to 100 keV. A full R-matrix analysis was performed to fit both the 9Be(p,d)8Be and 9Be(p,α)6Li reactions, simultaneously. The resulting astrophysical S(E) factors agree well with direct measurements, leading to S(0) = 17.3 ± 2.1 and 13.9 ± 1.8 MeV·b for the 9Be(p,d)8Be and 9Be(p,α)6Li reactions, respectively. The reaction rates were also calculated in the temperature range from 0.01 to 1 T9, which improve the precision of standard database NACRE and NACRE II.

Primary authors: Dr ZHANG, Qian (Center for Nuclear Study, University of Tokyo, Japan); Prof. FANG, Kaihong (School of Nuclear Science and Technology, Lanzhou University); Prof. HU, Jun (Institute of Modern Physics, Chinese Academy of Sciences); Prof. WANG, Tieshan (School of Nuclear Science and Technology, Lanzhou UniversitySchool of Nuclear Science and Technology, Lanzhou University); Prof. KASAGI, Jirohta (Research Center for Electron Photon Science, Tohoku University)

Co-authors: Prof. YAMAGUCHI, Hidetoshi (Center for Nuclear Study, University of Tokyo); Dr HAYAKAWA, Seiya (Center for Nuclear Study, University of Tokyo); Ms OKAWA, Kodai (Center for Nuclear Study, University of Tokyo)

Presenter: Dr ZHANG, Qian (Center for Nuclear Study, University of Tokyo, Japan)

Session Classification: Young Scientist Session 1