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Electrodisintegration of 16O and determination of astrophysical S-factors of the inverse reaction

Friday, 27 May 2022 11:45 (30 minutes)

After more than five decades of experimental effort the rate of ⊠ on 12C radiative capture at astrophysical energies (⊠⊠⊠ ~ 0.3 MeV above threshold) is not determined with desired precision and it is a cause of the largest uncertainty contribution in modeling of evolution of massive stars and underlying nucleosynthesis. By using the windowless gas jet target and modern energy-recovery linear accelerators (ERLs, CBETA at Cornell, NY, USA and MESA in Mainz, Germany) to reach high luminosity, a high precision measurement of the electron scattering on 16O nucleus would provide a method to determine the rate of the ⊠ on 12C radiative capture for energy range ⊠⊠⊠ < 2 MeV with a superb precision compared to previous experiments [1]. The feasibility of this method still needs to be studied. This could be done in a moderate luminosity experiment at existing electron accelerator sites by measuring the rate at ⊠⊠⊠ > 2 MeV where the cross section is much larger.

[1] I. Friščić, T. W. Donnelly, and R. G. Milner, Phys. Rev. C 100, (2019) 025804

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Attendance

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Scheduling Constraints

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