

ERNA commissioning for the $^{12}\text{C}(\alpha, \gamma)^{16}\text{O}$

Monday, 9 May 2022 15:30 (20 minutes)

Abundance of carbon and oxygen in the universe is one of the main questions of Nuclear Astrophysics. Its knowledge is strictly bound to the determination of the reaction rate of $^{12}\text{C}(\alpha, \gamma)^{16}\text{O}$ which heavily influences star evolution.

At the energy of astrophysical interest (~ 300 keV) multiple transitions contribute to the cross section and its absolute value is too low to allow a direct measurement. Such a circumstance explains the need for high-precision measurements at higher energies to extrapolate accurate S-factor in the region of interest.

After its success in measuring the $^{12}\text{C}(\alpha, \gamma)^{16}\text{O}$ with uncertainties below 10% in the energy range from 1.9 to 4.9 MeV in Bochum, the ERNA separator has been moved to the Tandem laboratory of the University of Campania, Caserta, where several improvements have been developed.

The apparatus is now capable of measuring down to 1 MeV in the CM reference with the capability of distinguish the transition components making up the total cross section.

In this contribution commissioning of the setup and planned measurement campaign will be presented.

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Session Classification: Astrofisica nucleare II