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Radiative neutron capture rate of ^{11}B(n,γ)^{12}B reaction from the Coulomb dissociation of ^{12}B

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Radiative capture reactions with light neutron-rich nuclei are known to be important constituents at sites of explosive nucleosynthesis while producing seed nuclei for the r-process. One such important reaction is the ^{11}B(n,γ)^{12}B radiative neutron capture reaction, where the total reaction rate has significant contributions from the resonant (narrow-resonances) as well as the non-resonant continuum.

A paucity of experimental direct capture reaction data forces the determination of the rate of this reaction by indirect approaches. We will present the capture cross sections and the subsequent non-resonant rates of ^{11}B(n,γ)^{12}B reaction calculated by using the Coulomb dissociation as an indirect method through the finite range distorted wave Born approximation (FRDWBA) theory. We will try to bring out the importance of accounting for the proper nuclear structure of the nuclei involved. The reaction rates at the relevant astrophysical temperatures would also be compared with proton and α-capture reaction rates of ^{11}B extracted from the literature.

Primary author: Dr SINGH, Gagandeep (Institute for Nuclear Physics, Johannes Gutenberg University)

Co-authors: Dr ., Shubhchintak (Department of Physics, Punjabi University Patiala, Patiala 147002, Punjab, India); Prof. CHATTERJEE, Rajdeep (Department of Physics, Indian Institute of Technology Roorkee, Roorkee 247667, India)

Presenter: Dr SINGH, Gagandeep (Institute for Nuclear Physics, Johannes Gutenberg University)

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