

Measurement of radiative widths of excited states above the alpha-decay threshold in ^{12}C

In the normal sequence of stellar evolution, ^{12}C synthesis ordinary proceeds through the 0_2^+ excited state at $E_x = 7.65$ MeV, so-called triple alpha process. At very high temperature ($T_9 > 1$) such as supernova explosion, the 3_1^- state at $E_x = 9.64$ MeV also plays an important role. But the 3_1^- radiative decay width is still unknown and only the upper and lower limit is provided at present. For this reason, it is very important to measure the radiative width of 3_1^- state at $E_x = 9.64$ MeV for better understanding of triple alpha process. In order to determine this width, we have proposed a new experiment at RCNP. In this experiment, we perform the inverse kinematics measurement of inelastic proton scattering from ^{12}C at an incident energy of $E = 20.8$ MeV/u. We have already performed the test experiment. We present the results of the test experiment and the prospects of a new experiment.

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