MEASUREMENT OF THE STRENGTHS OF THE RESONANCES AT 417, 611, AND 632 keV IN THE $^{22}Ne(p,\gamma)^{23}Na$ REACTION

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The $^{22}Ne(p,\gamma)^{23}Na$ reaction is part of the NeNa cycle of hydrogen burning. This cycle plays a key role in the nucleosynthesis of the elements between ^{20}Ne and ^{27}Al in red giant stars, asymptotic giant stars and classical nova explosions [1,2]. The strengths of the resonances at proton energies above 400 keV are still affected by high uncertainty [3,4]. In order to reduce this uncertainty, a precision study of the most intense resonances between 400 keV and 700 keV has been performed at the HZDR 3 MV Tandetron. The target, made of ^{22}Ne implanted in a 0.22 mm thick Ta backing, has been characterized using the 1278 keV and 458 keV resonances, well known in literature [4,5]. Subsequently, the strengths of the resonances at 417, 611, and 632 keV were determined. Two HPGe detectors equipped with active anti-Compton shielding have been used. The new resonance strengths are more precise than previous work. – Supported by the European Union (SPIRIT EC contract no. 227012).

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