LOW-ENERGY RESONANCES IN THE ^{22}Ne(p,gamma)^{23}Na REACTION DIRECTLY OBSERVED AT LUNA

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The neon-sodium cycle of hydrogen burning influences the synthesis of the elements between ^{20}Ne and ^{27}Al in red giant stars and novae explosion [1-2].
In order to reproduce the observed elemental abundances, the cross sections of the reactions involved in the nucleosynthesis process should be accurately known.
The ^{22}Ne(p,gamma)^{23}Na reaction rate is very uncertain because of a large number of unobserved resonances lying in the Gamow window [3]. For proton energies below 400 keV, in the literature there are only upper limits for the resonance strengths.

A new direct study of the ^{22}Ne(p,gamma)^{23}Na has been performed at the Laboratory for Underground Nuclear Astrophysics (LUNA) [4] in Gran Sasso using a windowless gas target and two high-purity germanium detectors. Several resonances have been observed for the first time in a direct experiment.
The experimental setup and preliminary strengths for the newly observed resonances will be shown.

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