

## $^{22}\text{Ne}(\alpha,\gamma)^{26}\text{Mg}$ with EAS $\gamma$

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The reaction  $^{22}\text{Ne}(\alpha,\gamma)^{26}\text{Mg}$  is associated with several questions in nuclear astrophysics like the Mg isotope ratio in stellar atmospheres and its competition with the neutron source  $^{22}\text{Ne}(\alpha,n)^{25}\text{Mg}$ .

Due to very low stellar energies and therefore very low cross section, direct experiments have been only able to provide upper limits below a strong resonance at 832 keV.

The purpose of the EAS $\gamma$  project is to perform the first direct measurement of the  $^{22}\text{Ne}(\alpha,\gamma)^{26}\text{Mg}$  in the range of astrophysical interest below 600-800 and the remeasurement of the 832 keV resonance.

The measurement will be carried out using the new LUNA MV accelerator at Laboratori Nazionali del Gran Sasso, which provides a high and stable  $\alpha$  particle current. Moreover, its position underground and additional passive shielding will reduce the  $\gamma$ -background. The  $\gamma$ -rays produced in the reaction will be detected by a NaI scintillator array surrounding a windowless, recirculating gas target.

Additional information on the excited state of  $^{26}\text{Mg}$  near the alpha threshold will be provided by an indirect measurement via  $^7\text{Li}(^{22}\text{Ne}, t)^{26}\text{Mg}$  in inverse kinematics, scheduled at the TRIUMF laboratory in Vancouver.

We present the current status of the project and an overview of the planned TRIUMF experiment.

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