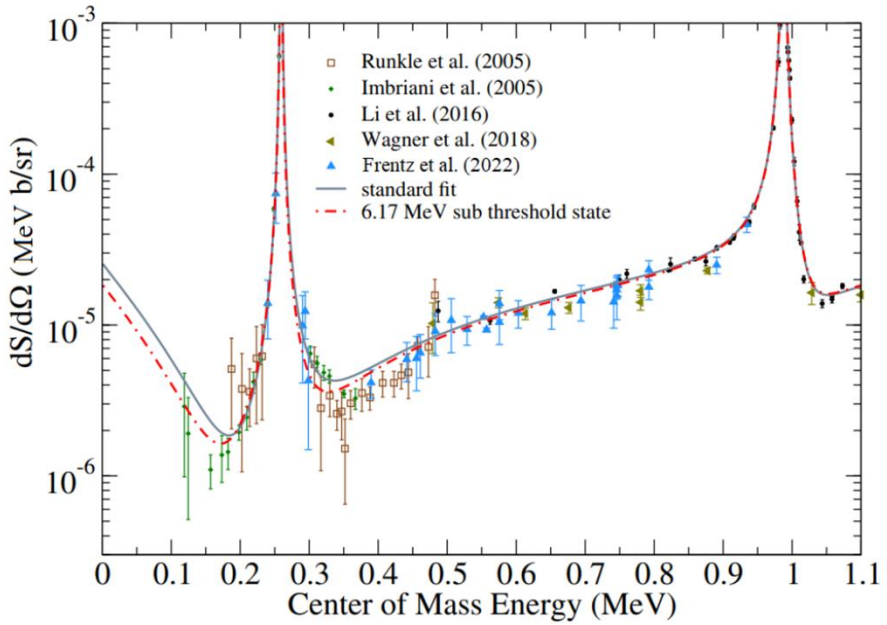
The SOCIAL project: Measurement of the $^{14}N(p,\gamma)^{15}O$ cross section

G.Gosta[1] for the LUNA collaboration
giulia.gosta@unimi.it
[1]Università degli Studi di Milano and INFN Milano

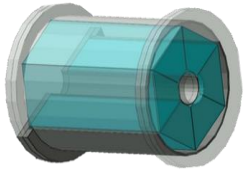
$^{14}N(p,\gamma)^{15}O$ is the bottleneck of the CNO cycle, therefore it controls its total rate. A precise determination of its cross section is needed, e.g., to infer the chemical composition of the solar core from the CNO neutrino flux.

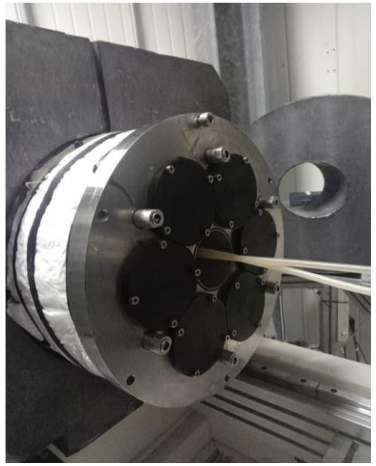


Adapted from B. Frentz et al. Phys. Rev. C 106 (2022), p. 065803.

New measurement of $^{14}N(p,\gamma)^{15}O$ partial cross sections is underway at LUNA-400 kV

- proton beam with 100 keV < Ep < 400 keV, I ≈ 200 μA
- TiN sputtered targets produced @INFN-LNL
- 4π-BGO detector composed by 6 independent segments + lead shielding
- Branchings derived through a detailed analysis of time coincidences





Visit poster id #106 for all details!