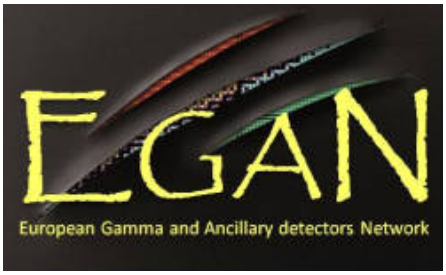

Contribution ID: **54** Type: **not specified**

Lifetime measurement of the 6.792 MeV state in ¹⁵O with the AGATA Demonstrator

Thursday, 30 June 2011 17:17 (17 minutes)

The results from the lifetime measurement of the first 3/2+ state in 15O are discussed. This state corresponds to a sub-threshold resonance in the 14N(p,γ)15O reaction, the slowest one of the CNO cycle. The accurate determination of the width of this resonance is of paramount importance in the evaluation of the astrophysical factor and the derived cross section [1]. For this purpose, an experiment was performed to measure the lifetime of the first 3/2+ state in 15O, decaying by a 6.792 MeV E1 transition to the ground state, by means of the Doppler Shift Attenuation method. Gamma rays were detected by the AGATA Demonstrator, placed close to the beam line, providing a continuous angular distribution of the emitted gamma rays.
The first excited states in 15O (and 15N) were populated via nucleon transfer and fusion-evaporation reactions of 14N on 2H (implanted at the surface of a ~4 mg/cm2 Au layer) at 32 MeV beam energy, provided by the XTU Tandem at LNL. The procedure and steps followed in the data analysis are described together with some results of the high-energy gammas calibration. Spectra of several high-energy gamma rays de-exciting 1-10 fs lifetime levels in the populated nuclei will be shown and compared with the result of detailed simulations.
[1] C. Peña-Garay and A. M. Sereneli, in preparation (2008) and arXiv: 0811.2424v1 [astro-ph]

Primary author: MICHELAGNOLI, Caterina (INFN and University of Padova)

Co-authors: GOTTARDO, Andrea (INFN LNL); CACIOLLI, Antonio (INFN Padova); UR, Calin (INFN Padova); BROGGINI, Carlo (INFN Padova); ROSSI ALVAREZ, Carlos (INFN Padova); BEMMERER, Daniel (elmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany); MENGONI, Daniele (INFN Padova); BAZZACCO, Dino (INFN Padova); SAHIN, Eda (INFN LNL); FARNEA, Enrico (INFN Padova); FILMER, Fay (University of Liverpool, Liverpool, UK); RECCHIA, Francesco (INFN Padova); POLLAROLO, Giovanni (INFN and Università di Torino, Torino, Italy); VALIENTE-DOBON, Jose Javier (INFN LNL); ERHARD, Martin (INFN Padova); MARTA, Michele (Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany); Dr MENEGAZZO, Roberto (INFN Padova); DEPALO, Rosanna (INFN LNL); KEMPLEY, Ryan (Department of Physics of the University of Surrey, Guildford, UK); MCADOO, Ryan (INFN LNL); Prof. LUNARDI, Santo (INFN and University of Padova); SZUECS, T. (ATOMKI, Debrecen, Hungary); MIJATOVIC, Tea (Ruder Boşković Institute, Zagreb, Croatia); FUELOEP, Zsolt (ATOMKI, Debrecen, Hungary)

Presenter: DEPALO, Rosanna (INFN LNL)

Session Classification: First results & experiment status