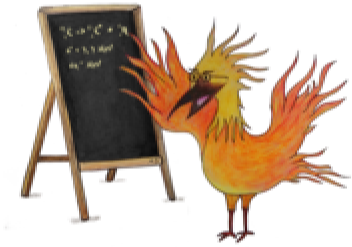

ID de Contribution: **25** Type: **Talk**

First life time measurements in the ^{78}Ni region with AGATA and VAMOS at GANIL

mardi 30 mai 2017 18:05 (15 minutes)

Yrast (\textit{i.e.} the state with the lower energy for a given spin-partiy) and near-Yrast states were populated in the ^{78}Ni region by fusion-fission reaction ^{238}U(^{9}Be,Xγ) at GANIL. The prompt γ-rays were detected by the AGATA array\footnote{S. Akkoyun \textit{et al.}, \textit{AGATA - Advanced GAmma Tracking Array}, NIM A668 (2012) 26-58} and particle identification was achieved
using the VAMOS++ spectrometer\footnote{M. Rejmund \textit{et al.}, \textit{Performance of the improved larger acceptance spectrometer : VAMOS++}, NIM A646 (2011) 184-191}. Life time measurements were performed using the Recoil Distance Doppler Shift technique developed at Cologne\footnote{J. Litzinger \textit{et al.}, \textit{Transition probabilities in neutron-rich ^{84,86}Se}, Phys. Rev. C 92, 064322 (2015)} with the Orsay plunger device OUPS\footnote{J. Ljungvall \textit{et al.}, \textit{The Orsay Universal Plunger System}, NIM A679 (2012) 61-66}.

The goal of the experiment was to populate Yrast states in N=51 neutron-rich odd-isotones from ^{89}Sr ($Z=38$) down to ^{83}Ge ($Z=32$) in order to study the high-ℓ single-particle states effective energy evolution above the $N=50$ shell gap and complement the scarce direct nucleon exchange data presently available\footnote{J.S. Thomas \textit{et al.}, \textit{Single-neutron excitations in neutron-rich ^{83}Ge and ^{85}Se}, Phys. Rev. c 76, 044302 (2007)}. These reactions are indeed difficult to exploit with presently available post-accelerated radioactive ion beams (especially for high-ℓ orbitals) in this exotic region. More specifically, we have focused our attention on the $\nu 1g_{7/2}$ monopole drift which is key to understanding the possible evolution of the spin-orbit splitting due to the action of the proton-neutron interaction terms in the ^{78}Ni region. Our strategy was to measure low lying $7/2^{+}$ states life times as their relative change along the $N=51$ line towards $Z=28$ should reflect their possible $\nu 1g_{7/2}$ composition. The tensor mechanism\footnote{T. Otsuka \textit{et al.}, \textit{Evolution of nuclear shells due to the tensor force}, Phys. Rev. Lett. 95, 232502 (2005)} indeed predicts increasing low-lying $\nu 1g_{7/2}$ single particle components in the wavefunctions approaching ^{79}Ni.

In this talk, the particle identification and the life time measurement method will be presented with some examples.

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