Contribution ID: **95** Type: **Oral**

Study of the 84Ga beta-decay at the ALTO facility

Friday, 25 May 2012 11:50 (20 minutes)

There is an increasing interest in studying the evolution of the collectivity of neutron-rich nuclei beyond N=50. Germanium isotopes are well known to undergo collective effects such as vibrations or gamma softness. It is particularly interesting to study 84Ge as it is the first even-even nucleus beyond N=50. The nature of the collectivity can be probed by measuring the excitation energies of the first 2+, 4+, 0+ states. We have studied beta-decay of a neutron rich 84Ga isotope at the ALTO facility in IPN Orsay. The fission fragments were produced with photo-fission reaction induced by 50MeV electron beam in a thick UCx target. For the first time the maximum electron beam intensity at ALTO - 10μA - was used. The gallium atoms were selectively ionized with a newly developed laser ion source. With this ion source the ionization of the gallium was more than ten times higher compared to the surface ion source. The ions were separated with the PARRNe mass separator and implanted on a mylar tape station. Two germanium detectors were used for the detection of gamma-rays and a plastic 4PiBeta detector for beta detection. The improved level scheme for 84Ge will be presented and compared with the shell model calculations performed with ANTOINE code using "ni78-jj4b "interaction (which is the modified version of the residual interaction developed by K.Sieja et.al. for the 78Ni natural valence space).

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Session Classification: Nuclear Structure far from Stability

Track Classification: Nuclear structure far from stability