

Neutron deficient exotic nuclei and the Physics of the "proton rich side" of the nuclear chart



Contribution ID : 5

Type : **not specified**

Structure of proton emitting nuclei

Monday, 21 February 2011 11:40 (40)

We have performed theoretical calculations to describe the structure of nuclei at the extremes of stability, using the nonadiabatic quasiparticle approach. We reproduce the experimental half-life for proton radioactivity in ^{121}Pr assuming $J = 7/2^-$ as decaying state, showing for the first time clear evidence for partial rotation alignment in a proton emitting nucleus¹.

Recent findings suggest the departure from axial deformation in the region of proton emitting nuclei. Our calculation for $^{145}\text{Tm}_2$, giving the energy spectra of parent and daughter nuclei, half-life and fine structure, confirmed a large triaxiality. Similarly, we have studied decay of $^{141}\text{Ho}_3$, the only known nucleus for which fine structure in proton emission from both ground and isomeric states was observed. The interpretation of the data pointed out to the breaking of axial symmetry in this emitter.

The present studies provide new theoretical tools to access nuclear structure properties far from the stability domain.

1 M. C. Lopes, E. Maglione, L. S. Ferreira, Phys. Lett.B 673(2009)15

2 P. Arumugam, L.S. Ferreira, and E. Maglione Phys. Rev. C78(2008) 041305

3 P. Arumugam, L.S. Ferreira, and E. Maglione Phys. Lett. B680(2009)443

Summary

Co-author(s) : MAGLIONE, E. (INFN Padova); FERREIRA, Lída S. (Centro de Física das Interações Fundamentais, and Departamento de Física, Instituto Superior Técnico)

Presenter(s) : MAGLIONE, E. (INFN Padova)

Session Classification : Monday February 21st, 2011. 11:00 - 13:00