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## Nuclear structure of proton drip-line nuclei

Exploring the nuclear structure properties of nuclei at the extremes of proton stability, is a quite challenging procedure, since these nuclei cannot be used in direct experiments due to their very unstable nature. An indirect way to probe them, might be required.

From their production in fusion evaporation and multi fragmentation reactions, according to the mass region that is probed, one can gather data on their fast decay, and in some cases with tagging techniques obtain their spectrum. It is in this context, that the theoretical interpretation of the experimental decay data of proton radioactive nuclei is a perfect indirect tool, to explore nuclear structure properties at the extremes of proton stability.

Ground state proton emission has been observed in nuclei with charges 50<Z<83, with the exception of promethium, mapping the proton drip-line in this region. Below Z=50, few cases of direct proton emission have been observed.

We have developed theoretical models [1-3] that describe the decay data by proton emission, and by the consistent interpretation of the experimental half lives, branching ratios and spectrum, we were able to predict the nuclear shape parameters and quantum numbers of the decaying states, for axial and non-axial deformation in odd-even and odd-odd nuclei. The breaking of axial symmetry for example, hinted in some experimental data, was confirmed by the theory [2]

These studies, test far from the stability region nuclear structure models, helping to determine the sequence of single particle levels, and in the case of odd-odd nuclei, explore the effect of the residual neutron-proton interaction [4,5]. They are also a good input to nuclear astrophysics models in their understanding of the trajectory, time scale, and ending point of the rp- process [6,7].

It is the purpose of this talk to discuss results obtained in our studies of these exotic decays, and its implication to the assignment of some features of the nuclear structure involved in them.

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[4]"Probing triaxiality beyond the proton drip line: Spectroscopy of 147Tm"

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