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Charged-particle decay studies in the ^{100}Sn region

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The region of α decaying nuclei close to ^{100}Sn offers a unique opportunity to study α decays, where the valence nucleons occupy the same orbitals. This might give a rise to exceptionally high α-particle preformation factor, leading to very fast α decay. This kind of enhanced α decay was suggested already in 1965 [1], however, to date there is no confirmation for the existence of this so called superallowed α decay. The most enhanced known α emitter is ^{212}Po, however, this case is lacking the $N = Z$ symmetry. The α decays of ^{112}Ba, ^{108}Xe, and ^{104}Te are expected to compete for the fastest known α decay [2].

The astrophysical rp-process has been proposed to terminate with rapid α decays of proton rich tellurium isotopes. The details of the termination depends on the single proton separation energies of antimony isotopes [3]. These energies can be probed indirectly by measuring the proton and α-decay energies in this region.

In this presentation, preliminary results of an experiment performed at ATLAS, Argonne National Laboratory, using the Fragment Mass Analyzer (FMA) to study charged-particle decays in the ^{100}Sn region will be presented.

[1] R. Macfarlane *et al.*, Phys. Rev. Lett. 14, 4 (1965)
[2] P. Mohr, Eur. Phys. J. A 31, 23 (2007)
[3] C. Mazzocchi, *et al*, Phys. Rev. Lett. 98, 212501 (2007)

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