

FAKULTÄT für PHYSIK
LUDWIG-MAXIMILIANS-UNIVERSITÄT
MÜNCHEN/GARCHING

PHYSIK-DEPARTMENT
TECHNISCHE UNIVERSITÄT MÜNCHEN
MÜNCHEN/GARCHING

MLL-KOLLOQUIUM

Donnerstag, 16.01.2014, 16¹⁵ Uhr

Hörsaal der LMU in Garching, Am Coulombwall 1
Treffen zum gemeinsamen Kaffee 16 Uhr

Dr. Thomas Faestermann

(TU München, Physik-Department E12)

The atomic nucleus ^{100}Sn : doubly magic and extremely exotic

This talk is intended for a general audience of physicists:

Nuclei have - like atoms - a shell structure, and nuclei with closed shells of protons and neutrons have special properties: they are inert against internal excitations, however their beta decay may show particularly large strength. ^{100}Sn is such a doubly magic nucleus, with 50 protons and 50 neutrons. It has a large excess of protons - stable nuclei with 100 nucleons have only 42 or 44 protons. Due to the strong Coulomb repulsion it is only marginally bound against one-proton or two-proton emission and the production cross section is very small. We succeeded in producing and identifying 259 such nuclei at the accelerators of GSI in Darmstadt. The nuclei were stopped in a detector system and beta-decays at the same position as well as gamma rays were detected. Thus we could determine the halflife, the beta-decay energy and the energies of the succeeding gamma transitions. It turns out that ^{100}Sn has the largest beta-decay strength of all nuclei (after dividing out the trivial energy dependence). This proves the pure shell model character of this nucleus.

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