

**A search for neutron single-particle states
populated via proton emission
from ^{146}Tm and ^{150}Lu**

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We report on our re-investigation of the proton emission from the odd-odd nuclei ^{146}Tm and ^{150}Lu . The aim of our study was to search for neutron single-particle levels of the very exotic even- Z , odd- N daughters ^{145}Er and ^{149}Yb populated via proton emission. These excited neutron single-particle states are expected to be low lying on the basis of calculations using a spherical macroscopic-microscopic model [1] and on the basis of experimentally observed systematics [2]. This work represents the first attempt to search for fine structure in the proton decay of a spherical nucleus. The ^{146}Tm and ^{150}Lu nuclei were produced in the $p3n$ fusion-evaporation channel using a ^{58}Ni beam and ^{92}Mo and ^{96}Ru targets respectively. The HRIBF Recoil Mass Spectrometer (RMS) together with the Position Sensitive Avalanche Counter (PSAC) and a DSSD-silicon particle telescope was used to separate and identify the reaction products and to measure their decay properties.

[1] W. Nazarewicz, M. A. Riley and J. D. Garrett, Nucl. Phys. A **512**, 6 (1990).

[2] K. S. Toth, D. C. Sousa, P. A. Wilmarth, J. M. Nitschke, and K. S. Vierinen, Phys. Rev. C **47**, 1804 (1993).