OBSERVATION OF THE EXOTIC NUCLEUS ^{145}Tm VIA ITS DIRECT PROTON DECAY[1]

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Proton emission from ^{145}Tm was observed for the first time via the ^{92}Mo(^{58}Ni,p4n) reaction, using the Holifield Radioactive Ion Beam Facility Recoil Mass Spectrometer in conjunction with a double-sided Si strip detector at the focal plane. The measured energy of the emitted proton is 1.728(10) MeV and its half-life is 3.5(10) μs, the shortest ever observed for ground-state proton radioactivity. When compared to the calculated WKB half-life for an l = 5 transfer, the spectroscopic factor is 0.51(16), which is consistent with the value of 0.64 calculated via the BCS approximation for a spherical nucleus. Also, the half-life of ^{113}Cs was determined with a greater precision than previously available to be 16.7(7) μsec.

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