



Contribution ID: 12

Type: Submitted

Competition between allowed and first-forbidden beta decay: $^{208}\text{Hg} \rightarrow ^{208}\text{Tl}$

Thursday 26 November 2020 15:20 (20 minutes)

The β decay of ^{208}Hg into the one-proton hole, one neutron-particle $^{208}_{81}\text{Tl}_{127}$ nucleus was investigated at the ISOLDE Decay Station. Shell-model calculations describe well the level scheme deduced, validating the proton-neutron interactions used, with implications for the whole of the $N > 126$, $Z < 82$ quadrant of neutron-rich nuclei. While both negative and positive parity states with spin 0 and 1 are expected within the Q_β window, only three negative parity states are populated directly in the β decay. The data provide a unique test of the competition between allowed Gamow-Teller and Fermi, and first-forbidden β decays, essential for the understanding of the nucleosynthesis of heavy nuclei in the rapid neutron capture process. Furthermore, the observation of the parity changing $0^+ \rightarrow 0^-$ β decay where the daughter state is core excited is unique, and can provide information on mesonic corrections of effective operators.

The work was recently accepted for publication in Physical Review Letters.

Primary author: PODOLYAK, Zsolt (University of Surrey (GB))

Presenter: PODOLYAK, Zsolt (University of Surrey (GB))

Session Classification: Beta-decay Session