# $^{4}$H

In 1981, Sennhauser described the observation of an unbound resonance of $^{4}$H in "Observation of Particle Unstable $^{4}$H in Pion Absorption in $^{7}$Li" (1981Se11). Negative pions produced at the Swiss Institute for Nuclear Research in Villigen bombarded a natural lithium target to form $^{4}$H in the reaction $\pi^{-}+^{7}\mathrm{Li} \rightarrow ^{3}\mathrm{H} + ^{4}\mathrm{H}$, which subsequently decays into $^{3}$H and a neutron. The tritons were identified with two collinear solid state $\Delta E-E$ telescopes. "The histogram shows the experimental data, the dashed line the three-body phase space contribution (18%) and the solid line the fit of the calculated spectra to the experimental data, determined by an $^{4}$H resonance at (2.7$\pm$0.6) MeV with a reduced width $\gamma^{2}$ = (2.3$\pm$0.6) MeV." Earlier reports of $^{4}$H resonances were considered inconclusive or contradictory (1981Se11).

First evidence that $^{4}$H was unstable with respect to neutron emission was reported 30 years earlier by McNeill and Rall (1951Mc37).

Adapted from reference (2012Th01)


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