

The Nuclear Structure of Di-Proton Decay

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In the last few years experimental data has accumulated for the rare mode of di-proton decay in ^{45}Fe [1–3], ^{48}Ni [3] and ^{54}Zn [4]. The predictions for the Q values of these decays based on models of the IMME will be discussed [5–9]. The R-matrix model of Barker [10] is used to connect the decay rate to the nuclear structure in terms of the di-proton spectroscopic factors. The spectroscopic factors are calculated with large-basis fp-shell wavefunctions [3, 4, 11]. The experimental decay rates are enhanced over the calculated rates. The role of correlations beyond the fp shell will be examined. The connections to two-nucleon transfer experiments such as (p,t) as well as to the new mode of direct two-proton knockout for radioactive beams [12, 13] will be discussed.

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