Abstract for an Invited Paper for the DNP11 Meeting of The American Physical Society

Multiple proton decays of ⁶Be, ⁸C, ⁸B(IAS) and excited states in ¹⁰C LEE SOBOTKA, Washington University

Recent technical advances have allowed for high-order correlation experiments to be done. We have primarily focused on experiments in which the final channels are composed of only alphas and protons. Four cases we have studied are: ⁶Be, ¹⁰C^{*}, ⁸C, and ⁸B^{*}(IAS) via 3, 4, 5, and 3-particle correlation measurements, respectively. While the first case had been studied before, our work presents very high statistics in the full Jacobi coordinates (the coordinates needed to describe 3-body decay.) Our study of ¹⁰C excited states provides isolatable examples of: correlated 2p decay, from one state, and the decay of another which is unusually highly correlated, a "ménage a quatre." ⁸C decay presents the only case of sequential 3-body 2p decay steps (i.e. 2p-2p.) The intermediate in this 2-step process is the first example (⁶Be) mentioned above. Unlike the well-studied second step (⁶Be decay), the first step in this 2p-2p process provides another example of correlated 2p emission. The decay of ⁸B(IAS), the isobaric analog of ⁸C, also decays overwhelmingly by 2p emission, in this case to ⁶Li(IAS). This IAS-to-IAS 2p decay is one for which decay to the potential 1p intermediates is energetically allowed but isospin forbidden. This represents an expansion, over that originally envisioned by Goldanski, of the conceivable nuclear territory for 2p decay.