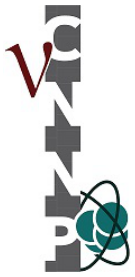

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Constraining electron-capture rates with data from charge-exchange experiments

Charge-exchange reactions have been used for a long time to extract Gamow-Teller transition strengths for a variety of applications in nuclear structure physics, nuclear astrophysics, and neutrino physics. Over the past few years, a dedicated effort has been made to constrain the nuclear structure calculations that are used to estimate electron-capture rates of importance for the late evolution of core-collapse supernovae, in particular in the N=50 region above Nickel-78. This effort involved (t,3He) experiments on Strontium-88, Krypton-86, and Niobium-93. The experimental work was combined with the development of a weak-rate library for astrophysical simulations and one-dimensional sensitivity studies of supernovae and their multi-messenger signals to uncertainties in electron-capture rates using that library. This presentation is an overview of these efforts, which involved a close collaboration between experimentalists and nuclear and astrophysical theorists.

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