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Ab initio calculations of beta-decay half-lives for N=50 neutron-rich nuclei

The total beta-decay half-lives of neutron-rich nuclei along magic neutron numbers remain largely unknown experimentally, while they are critical inputs for r-process simulations. In this talk, I will discuss our ab initio calculations for the half-lives of $N = 50$ isotones. Starting from two- and three-nucleon interactions derived from chiral effective-field theory, we solve the many-body Schrödinger equation with valence-space in-medium similarity renormalization group, a powerful method to address ground and excited states of closed- and open-shell systems. The Gamow-Teller transitions are calculated with the inclusion of consistent two-body currents, which were recently found to be a key input for explaining the g_A quenching puzzle. In addition, we consider the effects of first-forbidden transitions. Our results agree well with the existing experimental data, validating the predictive power of our approach.

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