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In-beam γ -ray spectroscopy towards the nucleon driplines

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The often surprising properties of neutron-rich nuclei have prompted extensive experimental and theoretical studies aimed at identifying the driving forces behind the dramatic changes encountered in the exotic regime. In-beam nuclear spectroscopy with fast beams and thick reaction targets where γ -ray spectroscopy is used to tag the final state provides information on the single-particle structure as well as on collective degrees of freedom in nuclei that are accessible for experiments at beam rates of only a few ions/s. Recent results from nuclear spectroscopy experiments that utilize the interplay of nuclear-structure effects and reaction mechanisms performed at the National Superconducting Cyclotron Laboratory at Michigan State University will be presented.