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Studying Proton Capture on Astrophysical Isomers with SECAR

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Isomeric states may play an important role in the rp-process, but as of yet are not regularly included in sensitivity studies. In astrophysical environments, isomers may be populated through thermal excitation, as a beta-decay end product, or a combination of these. Significant isomeric populations can alter the effective beta decay rate of a given isotope, and proton capture on these isomers may be enhanced relative to ground state capture based on the spin differences. The SEparator for CApture Reactions, SECAR, is uniquely positioned to undertake a program of proton capture reactions on astrophysically-important isomers, or “astromers.” Beam development efforts, as well as a proposed program to measure proton capture on astrophysical isomers using SECAR, will be presented.

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