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Nuclear Astrophysics with Gamma-ray Beams
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Experiments with γ-ray beams have opened many new opportunities in nuclear astrophysics. They include studies of photonuclear (γ,p), (γ,n) and (γ,α) reactions which play an important role in the large γ-ray flux during stellar explosions. Furthermore (α,γ) captures can be investigated through their time-inverse (γ,α) reactions with much thicker targets and, thus, increased luminosities. I will discuss the experimental program in nuclear astrophysics at HIγS, with particular emphasis on the present status and future plans of the $^{12}$C(α,γ)$^{16}$O reaction studies. This work was supported by the US Department of Energy, Office of Nuclear Physics, under contract DE-AC02-06CH11357.