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An overview of the research program at the High Intensity Gamma-Ray Source (HIGS) to study light nuclei[1]

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A program is underway at the HIGS facility to study the response of nucleons and light nuclei, namely the deuteron and 3He, to gamma rays having energies between photodisintegration threshold and 100 MeV. Major components of this program are: 1) the spin response of polarized deuterium and polarized 3He to circularly polarized gamma rays to study the Gerasimov-Drell-Hearn (GDH) sum rule; 2) Compton scattering from protons and deuterons to extract the static electromagnetic polarizabilities of the nucleons; 3) A first measurement of the proton spin-polarizabilities; and 4) measurement of total and differential cross sections of the deuteron and 3He at energies relevant to Big-Bang Nucleosynthesis (BBN). An overview of these programs and initial results will be presented.

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