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Prospects for Studying Photoproduction on Nuclear Targets with the GlueX Detector

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The GlueX detector in the experimental Hall D at Jefferson Lab was designed to search for gluonic excitations in the spectra of light mesons using photon beams. The detector provides a unique capability to study photoproduction on nuclear targets and extend the physics potential beyond the main spectroscopy program. A recently approved experiment in Hall D will study short-range correlated (SRC) pairing of nucleons within nuclei and search for Color Transparency (CT) at large momentum transfer. SRC has never been studied in photoproduction before. GlueX measurements will provide a complementary check of the reaction mechanism to electron and proton scattering. Measurement of the Color Transparency will verify recent theoretical calculations for GlueX beam energies and will decisively test the onset of CT. Several other physics topics are considered for GlueX, such as the study of the hadronic structure of the photon by measuring nuclear transparency of vector mesons, and extraction of the cross section of longitudinally polarized omega mesons on nucleons for the first time. The measurement of nuclear transparency over a wide energy range is important for understanding results from other experiments and will provide a sensitive probe to the degree of photon shadowing in nuclear matter. I will give an overview of the proposed physics program and discuss GlueX plans for the future.