# Tagged Neutron DVCS with BONuS12 in CLAS12

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**Abstract**

The three-dimensional picture of quarks and gluons in the nucleon is set to be revealed through deeply virtual Compton scattering (DVCS). With the absence of a free neutron target, the deuterium target represents the simplest nucleus to be used to probe the internal 3D partonic structure of the quasi-free neutron. We propose to measure the beam spin asymmetry (BSA) in incoherent neutron DVCS together with the approved BONuS12 experiment, using the same beam time and are asking for the electron beam to be highly polarized. The DVCS BSA on a (quasi-free) neutron will be measured in a wide range of kinematics by tagging the scattered electron and the real photon final state with the spectator proton. We will also measure BSA with all final state particles detected; the scattered electron, the real photon, the spectator proton, and the struck neutron. Both measurements of BSA of neutron DVCS, by tagging the recoil proton and in the fully exclusive final state, will help to understand the impact of the final state interactions (FSI) and Fermi motion on the incoherent neutron DVCS. The proposed measurements are highly complementary to the approved CLAS12 experiment E12-11-003, which will also measure the quasi-free neutron DVCS by detecting the scattered neutron.

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