



Contribution ID: 91

Type: **not specified**

A New Solid Polarized Target for CLAS12

Monday 26 September 2016 16:40 (25 minutes)

With Jefferson Lab's upgrade to a 12 GeV electron beam comes a new, improved detector system in Hall B: CLAS12. The dynamically polarized solid target, which was a mainstay of double-polarized scattering experiments in the 6 GeV era, must also be rebuilt to accommodate the new constraints. The new target and its horizontal refrigerator will fit in a space restricted by the new CLAS12 5 T solenoid and detector package, making the center of the target sit within a narrow clearance that tapers from 30 to 10 cm in diameter over a length of 2.3 m. The target will dynamically polarize NH₃ and/or ND₃ in two target cells at 5 T and 1 K using 140 GHz microwaves, and will provide protons and deuterons polarized to above 90% and 40%, respectively. We will present the proposed design of the new polarized target system for Hall B, and discuss the progress and challenges of the project.

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Session Classification: Targets

Track Classification: H. Targets