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The SoLID-TMD Program at Jefferson Lab

The Solenoidal Large Intensity Device (SoLID) is an advanced spectrometer under development in Hall A at Jefferson Lab. Designed for high-luminosity operation (10^{37}–10^{39} $cm^{-2}s^{-1}$) with both polarized (NH3 and 3He) and unpolarized hydrogen and deuterium targets, SoLID features large acceptance and full azimuthal coverage. It will fully exploit the capabilities of the 12 GeV CEBAF upgrade and is optimized for a broad range of physics programs, including precision measurements in semi-inclusive deep inelastic scattering (SIDIS) for three-dimensional nucleon imaging in momentum space. Several highly rated SIDIS experiments have been approved to extract transverse momentum dependent parton distribution functions (TMDs) with unprecedented precision. The current 11 GeV electron beam will allow SoLID to explore TMDs in the important valence quark region, and the proposed future 22 GeV upgrade will extend its kinematic range significantly. In this presentation, we will introduce the SIDIS program at Jefferson Lab using SoLID, highlight associated parallel run-group opportunities, and present updated impact on extracting TMDs.

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