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An update on the extraction of neutron SSAs from 3He data

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The time reversal-odd parton transverse momentum distributions (TMDs) [1]
in the neutron will be studied through polarized SIDIS experiments off 3He, where a high-energy pion is detected in coincidence with the scattered electron (see for example [2]). To disentangle the nuclear and the partonic degrees of freedom an accurate theoretical description of the process is needed. In Ref. [3] the plane wave impulse approximation (IA) was adopted. It was found that the nuclear effects described in IA can be taken into account in a simple effective way, and a procedure to safely extract the neutron SSAs was proposed. In a recent paper [4] the spectator SIDIS process off 3He was studied, and the final state interaction (FSI) between the hadronizing quark and a recoiling deuteron was taken into account through a distorted spin-dependent spectral function. We are now studying the standard SIDIS process, where the FSI between the observed pion and the remnant is again taken into account through a distorted spin-dependent spectral function [5]. The result, very interesting in particular for the experiments planned at the 12 GeV upgrade of JLab [2], is that in the nuclear SSA the effect of FSI cancels to a large extent and the ususal extraction appears to be safe.
An extension of the approach to a relativistic treatment will be addressed [6].

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Session

4: TMDs from azimuthal asymmetries in polarized SIDIS with transverse and longitudinal spin

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