



Contribution ID: 7

Type: **not specified**

## An update on the extraction of neutron SSAs from $^3\text{He}$ data

Thursday 3 September 2015 12:25 (15 minutes)

The time reversal-odd parton transverse momentum distributions (TMDs) [1] in the neutron will be studied through polarized SIDIS experiments off  $^3\text{He}$ , 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  $^3\text{He}$  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 usual extraction appears to be safe.

An extension of the approach to a relativistic treatment will be addressed [6].

### REFERENCES

- [1] V. Barone, F. Bradamante, a. Martin Prog. Part. Nucl. Phys. 65, 267, 2010.
- [2] G. Cates et al., E12-09-018, JLAB approved experiment, [hallaweb.jlab.org/collab/PAC/PAC38/E12-09-018-SIDIS.pdf](http://hallaweb.jlab.org/collab/PAC/PAC38/E12-09-018-SIDIS.pdf)
- [3] S. Scopetta, Phys. Rev. D 75, 054005 (2007).
- [4] L.P. Kaptari, A. Del Dotto, E. Pace, G. Salme and S. Scopetta, Phys. Rev. C 89, 035206 (2014).
- [5] A. Del Dotto, L. Kaptari, E. Pace, G. Salme and S. Scopetta, in preparation.
- [6] E. Pace, G. Salme<sup>†</sup>, S. Scopetta, A. Del Dotto and M. Rinaldi, Few Body Syst. 54, 1079 (2013); A. Del Dotto, L.P. Kaptari, E. Pace, G., Sergio Scopetta, Few-Body Syst. 55, 877 (2014).

### Session

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

**Author:** SCOPETTA, Sergio (Perugia University)

**Co-authors:** DEL DOTTO, Alessio (University of Rome-3); PACE, Emanuele (University of Rome-2, Torvergata, and INFN); SALME<sup>†</sup>, Giovanni (INFN Roma); KAPTARI, Leonid (JINR Dubna, Russia); RINALDI, Matteo (Perugia University and INFN)

**Presenter:** SCOPETTA, Sergio (Perugia University)

**Session Classification:** TMDs from azimuthal asymmetries in transversely and longitudinally polarized SIDIS