

# DIS2023: XXX International Workshop on Deep-Inelastic Scattering and Related Subjects



Contribution ID: 174

Type: **Parallel talk**

## Collins-type Energy-Energy Correlators and Nucleon Structures

*Thursday, 30 March 2023 10:00 (20 minutes)*

We study the energy-energy correlator (EEC) for the process of unpolarized hadrons production from transversely polarized partons Semi-Inclusive Deep Inelastic Scattering (SIDIS) for the first time. In the factorization formula we present, this event shape observable is correlated with the Collins function in the back-to-back limit. We show the structure functions of all the possible spin asymmetries that can arise in these processes. In SIDIS, twist-2 transverse-momentum-dependent parton distribution functions (TMDPDFs) are convoluted with EEC jet functions in the structure functions, indicating a new direction for probing nucleon structures using EEC. With the analytical formalism derived, we defined the Collins EEC jet function and provide predictions for the Collins asymmetry correlated with transversely polarized EEC jet functions at EIC kinematics. As an example of probing nucleon structures using EEC jets, we also present a Sivers asymmetry prediction in terms of EEC jet functions for the future EIC.

### Submitted on behalf of a Collaboration?

No

### Participate in poster competition?

**Primary authors:** Dr SHAO, Dingyu (Fudan University (CN)); ZHAO, Fanyi (UCLA); LEE, Kyle; KANG, Zhongbo (UCLA)

**Presenter:** ZHAO, Fanyi (UCLA)

**Session Classification:** WG5

**Track Classification:** WG5: Spin and 3D Structure