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The 143rd HENPIC seminar by Prof. Hua Xing Zhu 朱华星 (Zhejiang University), July 1, 2021, Thursday, 10:30 am (UTC+8)

Talk title: Probing Gluon Spin Correlation with Jet Substructure

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Speaker: Prof. HuaXing Zhu, Zhejiang University

Abstract:
The study of spin effects in QCD has a long history. Precision jet substructure opens new doors for studying these effects. To achieve this goal, one hopes to find a spin-sensitive observable that is also theoretically accessible to perturbative calculation and resummation, which is in general not an easy task.

In this talk, I will show that spin effects are encoded in the shape dependence of three-point correlator within a jet. In a particular kinematic limit, called the squeezed limit, one can see a sinusoidal pattern in the angular distribution of energy, which is the result of the interference of the spins of gluons in the jet. All orders resummation in this limit is governed by the twist-2 transverse spin-2 gluon operator. In the second part of the talk, I will show how Lorentz symmetry helps to re-organize the three-point correlator into partial wave, which resums higher-spin angular correlation and provides insight into splitting processes beyond leading power.

About the speaker:
HuaXing Zhu is a junior faculty member at Zhejiang University. He obtained his PhD from Peking University in 2012, after which he spent 5 years as a postdoc at SLAC and MIT. He is mainly interested in quantum field theory and its application to high energy colliders. He has published 60 papers, including 10 in Physical Review Letters. He is the recipient of 2020 Qiushi young scholar award by Qiushi Science and Technologies Foundation.

Presenter: Prof. ZHU, Hua Xing