

Probing medium-induced jet splitting in heavy-ion collisions

Wednesday, October 3, 2018 10:00 AM (20 minutes)

Medium-induced jet splitting function is one of the central quantities in studying the interaction of hard jets with the dense nuclear medium. Soft-drop groomed jet measurements provide a direct tool to probe jet splitting function and its medium modification. Based on higher-twist formalism, we study the nuclear modification of groomed jet splitting in heavy-ion collisions at RHIC and the LHC energies [1]. Assuming coherent energy loss for two splitted subjets, we obtain non-monotonic jet energy dependence for the nuclear modification of jet splitting function: strongest modification at intermediate jet energies. This helps to understand CMS and STAR groomed jet data: strong modification of the momentum sharing z_g distribution at the LHC whereas no obvious modification of the z_g distribution at RHIC. On the other hand, the assumption of independent energy loss for two subjets cannot explain the observed nuclear modification pattern of the groomed jet z_g distribution. We also study the dependence on the angular separation between two subjets and it is found that the nuclear modification of z_g distribution decreases with decreasing angular separation. The nuclear modification of groomed jet mass is also investigated. Future groomed jets measurements with lower jet energies at the LHC and larger jet energies at RHIC, for different angular separations between the two subjets will provide more stringent test of our understanding of jet-medium interaction.

Reference:

[1] Ning-Bo Chang, Shanshan Cao, Guang-You Qin, Phys.Lett. B781 (2018) 423-432

Summary

Primary authors: QIN, Guang-You (Central China Normal University); CHANG, Ning-Bo; CAO, Shanshan (Wayne State University)

Presenter: QIN, Guang-You (Central China Normal University)

Session Classification: Parallel 2