

The 237th HENPIC seminar by Zhong Yang(杨忠), Vanderbilt University

Title: Visualizing the jet-induced diffusion wake in heavy-ion collisions

Abstract: Diffusion wake, a distinctive consequence of the Mach-cone wake induced by the supersonic jets in ultra-relativistic heavy-ion collisions, depletes soft hadrons in the direction opposite to the propagating jet. According to coupled transport and hydrodynamic simulations, a valley in the 2-dimensional jet-hadron correlation in azimuthal angle and rapidity arises on the top of the multiple parton interaction ridge as an unambiguous signal of the diffusion wake induced by gamma-jets in heavy-ion collisions. In dijet events with a finite rapidity gap, the rapidity asymmetry of the jet-hadron correlation has been shown to be a robust signal of the diffusion wake. The same rapidity asymmetry can also be applied to gamma-jet events and both are background free. Experimental measurements of these signals can offer valuable insights into the properties of the quark-gluon plasma formed in high-energy heavy-ion collisions.

Brief introduction about the speaker: Zhong Yang is a postdoctoral researcher in the Department of Physics and Astronomy at Vanderbilt University. He received his Ph.D. from Central China Normal University (CCNU) in 2023 and began his postdoctoral work at Vanderbilt University in 2024. His research focuses on jet quenching and medium response in heavy-ion collisions, with a particular interest in medium-induced modifications of jet substructure.

Summary