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Enhancement of baryon-to-meson ratios around jets as a signature of medium response

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We present a unique signal of jet-induced medium excitations: the enhancement of baryon-to-meson ratios around the quenched jets. To illustrate this, we study jet-particle correlations and the distributions of jet-induced identified particles with respect to the jet direction in Pb+Pb collisions at the LHC via a multi-phase transport model. We find a strong enhancement of baryon-to-meson ratios for associated particles at intermediate transverse momentum around the triggered jets in Pb+Pb collisions relative to p+p collisions, due to the coalescence of jet-excited medium partons. Since the lost energy from jets can diffuse to large angles, such baryon-to-meson-ratio enhancement is more pronounced for larger relative distance from the jet axis. We argue that the experimental confirmation of the enhancement of jet-induced baryon-to-meson ratios around the jets will provide an unambiguous evidence for the medium response to jet quenching in heavy-ion collisions.

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Experiment/Theory

Theory/Phenomenology

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