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Study of Longitudinal Event-plane Decorrelation in Heavy-ion Collisions with a Multiphase Transport Model ZHIWAN XU, GANG WANG, University of California, Los Angeles — Measurements of pseudorapidity (η) dependence of local event-plane (EP) correlations provide novel inputs to the initial conditions in heavy-ion collisions. A factorization ratio of elliptic flow (v_2), $r_2(\eta) = \langle v_2(-\eta)\cos[2(\Psi_{\mathrm{m},-\eta} - \Psi_{\mathrm{f}})]\rangle / \langle v_2(\eta)\cos[2(\Psi_{\mathrm{m},\eta} - \Psi_{\mathrm{f}})]\rangle$, has been extensively used to quantify the decorrelation between two EPs at midrapidities ($\Psi_{\mathrm{m},\pm\eta}$) using a forward EP ($\Psi_{\mathrm{f}}$) as a reference. However, nonflow effects could cause features in r_2 similar to decorrelation. In this study, we shall employ a multiphase transport model (AMPT) to evaluate the sensitivity of several methods to both decorrelation and nonflow. Differential measurements of $r_2(\eta)$ and its slope, F_2, as well as their modified forms indicated possible nonflow effect contribution. We propose an alternative observable, $T_2 = \langle \sin(2(\Psi_f - \Psi_{m,1}))\sin(2(\Psi_b - \Psi_{m,2}))\rangle$, which has different sensitivity to dynamics of decorrelation from twist of initial participant matter and/or nonflow effect. We employ event-shape selection analysis technique to investigate features in F_2 and T_2, and discuss their physics implications.

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