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Effect of vorticity on the dynamical magnetic fields in heavy-ion collisions

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Magnetic fields in heavy-ion collisions are pivotal and subject to diverse factors. In this study, we quantitatively investigate the impact of fluid vorticity on the evolution of magnetic fields in the 20%-50% centrality class in Au + Au collisions, with collision energies of √sNN = (7.7, 14.5, 19.6, 27, 39, 62.4, 200) GeV. Our results indicate that fluid vorticity leads to a delay in the evolution of the magnetic field, in which this effect becomes more pronounced as the collision energy decreases. Additionally, we have calculated the mean magnetic field values on the freeze-out hypersurface for various collision energies. Our simulation results align with the values inferred from experimental data of $\Lambda - \bar{\Lambda}$, within the error margins.

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