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Signature of early freeze-out of strangeness in relativistic heavy ion collisions

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Freeze-out scenarios with separate freeze-out hypersurfaces for strange and non strange hadrons have been shown to successfully resolve the proton anomaly at the LHC and further improve the description of hadron yields across beam energy. These studies suggest that data favors an early freeze-out of strangeness. Such studies have been so far restricted within the framework of the hadron resonance gas thermal models to describe mid rapidity hadron yields. We implement the flavor dependent freeze-out scenarios within a relativistic viscous hydrodynamics framework by performing separate Cooper-Frye freeze-out of the strange and non strange hadrons. Our study suggests such flavor differential freeze-out scenarios have unique signature on the phase space dependence of produced particles. In particular elliptic flow of pion and spectra ratio of lambda to proton are most sensitive to such freeze-out systematics.

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