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Analytical solutions of hydrodynamics and their applications

We present analytical solutions of relativistic hydrodynamics for systems with cylindrical symmetry, incorporating boost-invariant longitudinal expansion and Hubble-like transverse flow. We also discuss an analytical solution for a spherically expanding system with Hubble-like symmetry. For both cases, we calculate hadron transverse momentum spectra on a constant-temperature freeze-out hypersurface. The resulting spectra can be directly compared with experimental data corresponding to cylindrical and spherical fireball geometries, respectively. Furthermore, we outline a solution corresponding to a non-boost-invariant scenario, which is particularly relevant in the low-energy collision regime.

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