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Suppression of elliptic flow without viscosity

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We investigate fluid-to-particle conversion using the usual Cooper-Frye approach but with more general local equilibrium distributions than the Boltzmann or Bose/Fermi distributions typically used. Even though we study ideal fluids (i.e., shear stress and bulk pressure are zero everywhere), we find a suppression of elliptic flow (v_2) at high transverse momenta ($p_T > 1.5$ GeV/c), relative to results obtained with the traditional Boltzmann distributions [1]. The non-viscous suppression shows qualitatively similar features to the well-known shear viscous suppression of v_2; for example, it increases with p_T, and it is smaller for heavier species as seen in self-consistent kinetic theory calculations. Our results question whether all of the v_2 suppression seen in the data can be attributed to viscous effects, and indicate that shear viscosities extracted from RHIC and LHC elliptic flow data might be overestimated. For more details, see Ref. [1].

[1] A. Takacs and D. Molnar, arXiv:1906.12311 [nucl-th]

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