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What initial energy fluctuations are necessary to correctly describe flow in ultra-central collisions?

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Modern models for describing heavy-ion collisions have difficulty reproducing observed flow in very central collisions – a problem known as the ultra-central flow puzzle. It is therefore useful to understand what properties the initial stages must have in order to be compatible with experimental data. To this end, we parameterize the early-time energy density and its fluctuations via its 1-point and 2-point function, and constrain them by using experimental data for $v_n\{2\}$ in conjunction with hydrodynamic simulations, including a systematic scan of model parameters such as shear and bulk viscosity. We compare the results to current models, and comment on why they fail to describe measurements.

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