

Relating anisotropic flow observables with initial conditions in the Quark Gluon Plasma

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Abstract

Anisotropic flow is one of the most important probes of ultrarelativistic nucleus-nucleus collisions. While early studies focused on elliptic flow generated by the almond shape of the interaction region in non-central collisions, most of the current activity concerns elliptic flow and higher harmonics (e.g. triangular flow) generated by granularity (“hot spots”) in the initial conditions. These flow observables are measured at RHIC and LHC and provide therefore an insight on the initial stage of the Quark Gluon Plasma.

Event-by-event hydrodynamics provides a natural way of studying these flow fluctuations: one typically supplies a set of initial conditions, then evolves these initial conditions through ideal or viscous hydrodynamics, then computes particle emission at the end. In this talk, I will present various results related to flow harmonics (p_t dependence [1], η dependence [2], v_n distributions [3], correlations of v_n and ψ_n [4]) and what we can learn from them.

[1] F. G. Gardim, F. Grassi, M. Luzum, J.-Y. Ollitrault Phys.Rev.Lett.109 (2012) 202302.

[2] M. Luzum, F. Gardim, F. Grassi, J. Noronha-Hostler, J-Y Ollitrault in progress.

[3] F. G. Gardim, F. Grassi, M. Luzum, M.V. Machado, M. J. Noronha-Hostler to be submitted.

[4] F. G. Gardim, F. Grassi, M. Luzum, J. Noronha-Hostler Phys. Rev. C 95 (2017) 034901.