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## Quantifying the QGP shear viscosity using the two-particle transverse momentum correlations

Monday 12 July 2021 19:40 (2 minutes)

Two-particle transverse momentum correlation functions are a powerful technique for understanding the dynamics of relativistic heavy-ion collisions. Among these, the transverse momentum correlator  $G_2(\Delta\eta, \Delta\varphi)$  is of particular interest for its potential sensitivity to the shear viscosity per unit of entropy density  $\eta/s$  of the quark-gluon plasma formed in heavy-ion collisions [1,2]. We used the UrQMD, AMPT, and EPOS models at  $\sqrt{s_{NN}}$  2760 and 200 GeV to investigate: the longitudinal broadening as well as the long range azimuthal dependence of the  $G_2(\Delta\eta, \Delta\varphi)$  correlator. We will present the centrality,  $\eta/s$ , and the event shape dependence of the longitudinal width  $\sigma(\Delta\eta)$  and the azimuthal harmonics  $a_n^{pT}$  of the  $G_2(\Delta\eta, \Delta\varphi)$  correlator [3]. Our calculations showed that  $G_2(\Delta\eta, \Delta\varphi)$  correlator can differentiate between theoretical models and constrain the determination of  $\eta/s$ .

[1] S. Gavin and M. Abdel-Aziz, Phys. Rev. Lett. 97, 162302 (2006)

[2] V. Gonzalez, et al., (2020), Eur.Phys.J.C 81 (2021) 5, 465

[3] Niseem Magdy, et al., arXiv:2105.07912

### Preferred track

Collectivity & Multiple Scattering

**Primary author:** BASU, Sumit (Lund University (SE))

**Co-author:** Dr ABDELRAHMAN, Niseem (University of Illinois at Chicago)

**Presenters:** BASU, Sumit (Lund University (SE)); Dr ABDELRAHMAN, Niseem (University of Illinois at Chicago)

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