Photon flow harmonics $v_n$ with chemical equilibration and non-ideal gas distribution

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Abstract

Elliptic and triangular flow of direct photons are experimentally found to be larger than those of hydrodynamic estimations, which is recognized as “photon puzzle”. I show numerically that (i) late quark chemical equilibration and (ii) in-medium corrections of parton distributions lead to suppression of early photons and to enhancement of photon anisotropy.

1. Introduction

Direct photon $v_n$ are larger than hydro calculations: “photon puzzle”

2. Quark chemical equilibration

Chemical equilibration can take longer than thermalization

3. In-medium effective distributions

The QGP is not an ideal gas

4. Numerical analyses

By direct photon $v_n$, $v_2$ is enhanced

5. Summary and outlook

Chemical equilibration and in-medium corrections to parton distribution would be important for understanding the “photon puzzle”

Future prospects include estimation of prompt photons and introduction of chemically non-equilibrated equation of state (Ch. Galis et al., JPG 30, S1033)