

Possible thermal photons in pp collisions and their effects in AA analyses

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Direct photons are a powerful tool for elucidating the properties of the hot QCD matter in heavy-ion collisions. They are estimated by assuming that the scaled baseline of proton-proton collision result, which exhibits fair agreement with perturbative QCD calculations, represents prompt photons. On the other hand, recent analyses on azimuthal momentum anisotropy show that a primordial fluid could be formed in small systems at top collision energies. There could also be other source of photons such as glasma photons. We investigate possible non-prompt photon contributions in proton-proton collisions and the effects of modified baseline on the interpretation of direct photon spectra and elliptic flow in heavy-ion collisions at CERN Large Hadron Collider.

Summary

Recent development in the study of collectivity in small systems motivates us to re-examine the validity of the prompt photon baseline determined by the scaled result of proton-proton collisions. We study possible non-prompt photon contributions in such collisions and their phenomenological consequences in heavy-ion analyses including direct photon elliptic flow.

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