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Recent developments in the theory of electromagnetic probes in relativistic heavy-ion collisions

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Electromagnetic probes are considered as clean messengers from the hot dense medium created in the Relativistic Heavy-Ion Collider (RHIC) and the Large Hadron Collider (LHC). In this talk, I will review the theoretical developments in the study of electromagnetic radiation in relativistic heavy-ion collisions. The recent progress in the rates for photon and lepton pair production is discussed. Together with the improvements in the hydrodynamic descriptions of the bulk medium, I will emphasise the combined efforts to resolve the "direct photon flow puzzle" in the RHIC and the LHC experiments. Further prediction of the direct photon production in high multiplicity proton-nucleus collisions at the LHC energy can serve as a signature of the quark gluon plasma formation in these small systems.

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