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Nuclear effects in direct photon and Drell-Yan production at the LHC

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Using the color dipole formalism we study production of direct photons and Drell-Yan pairs in pA interactions. Real photons and lepton pairs produced in a hard scattering are not accompanied with any final state interaction, either energy loss or absorption. Consequently, the associated observables may serve as more efficient and cleaner probes for nuclear modification effects than inclusive hadron production. We have shown that shadowing effects in production of lepton pairs coming from the coherence are suppressed at large invariant masses and at very large pT at mid-rapidities. Besides, we present a systematic analysis of the nuclear effects and perform predictions for nuclear suppression as a function of pT, rapidity and dilepton invariant mass that can be verified by the LHC experiments. We include and analyze also a contribution of coherent effects associated with gluon shadowing affecting the observables predominantly at small and medium-high pT.

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