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Transverse momentum broadening of vector bosons in nuclear collisions ZHONG-BO KANG, JIAN-WEI QIU, Department of Physics and Astronomy, Iowa State University, Ames, IA 50011 — We calculate in perturbative QCD the transverse momentum broadening of vector bosons in nuclear collisions. We evaluate the effect of initial-state parton multiple scattering for the production of Drell-Yan and W/Z bosons, and both initial- and final-state multiple scattering effect for heavy quarkonium production. We predict the transverse momentum broadening of W/Z bosons in heavy ion collisions at the LHC energies, and argue that the broadening should be a clean probe of initial-state medium effect [1]. For heavy quarkonium production, we found in both NRQCD and Color Evaporation model that the transverse momentum broadening of heavy quarkonia in hadron-nucleus collision is close to $2C_A/C_F$ times the corresponding Drell-Yan broadening, which is consistent with Fermilab E866 data [1]. We also predict a significant reduction of the transverse momentum broadening for heavy quarkonia in relativistic heavy ion collisions if a dense medium is formed.
[1] Z. B. Kang and J. W. Qiu, arXiv: 0707.0276 [hep-ph]

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