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Heavy flavor production under a strong magnetic field

The magnetic field created in high energy nuclear collisions will affect the dynamical processes in the QCD medium, especially the heavy quark production that happens in the initial stage of the collisions. We calculate in a strong magnetic field the heavy quark production cross section for the elementary process $gg \rightarrow Q\bar{Q}$ at leading order and the corresponding transverse momentum distribution in nucleus-nucleus collisions. In comparison to the QED process, the heavy quark production is dominated by the unique QCD channel with gluon self-interaction. Due to the dimension reduction of quark phase space in a strong magnetic field, the production is concentrated in a very narrow energy region above the threshold. Since the translation invariance is broken, the production becomes anisotropic in magnetic field.

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