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The parton cascade BAMPS with the improved Gunion-Bertsch matrix element

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An updated version of the partonic transport model Boltzmann Approach to MultiParton Scatterings (BAMPS) is presented, which allows interactions among all partons: gluons, light quarks, and heavy quarks with elastic and inelastic collisions. We introduce the improved Gunion-Bertsch matrix element, which cures problems of the original Gunion-Bertsch result in characteristic regions of the phase space. Verified by extensive numerical calculations, the improved matrix element agrees well with the exact calculation. With the new matrix element, important properties of the quark-gluon-plasma in heavy-ion collisions such as the thermalization time of the plasma and the shear viscosity over entropy density ratio are calculated within the microscopic transport model BAMPS. Furthermore, we compare our results of the nuclear modification factor and elliptic flow to experimental data at RHIC and LHC.

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