Bremsstrahlung as a probe of collision dynamics in a microscopic transport model

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Abstract

Bremsstrahlung from the interactions of individual charges in high energy Au+Au collisions at RHIC is computed from the ultra-relativistic quantum molecular dynamics model (UrQMD). By colliding hypothetical pure proton and pure neutron nuclei, one can examine in more detail the dynamical evolution that led to the final net-baryon distribution. It is shown that the degree of stopping can be revealed by bremsstrahlung without measuring any hadronic observables. More significantly bremsstrahlung can reveal the time scale of nuclear stopping, which hadronic observables cannot do.

[1] J.I. Kapusta, Phys. Rev. C 15 (1997) 1580.

[2] S. Jeon, J. Kapusta, A. Chikanian and J. Sandweiss, Phys. Rev. C 58 (1998) 1666.

[3] J.I. Kapusta and S.M.H. Wong, Phys. Rev. C 59 (1999) 3317.

[4] J.I. Kapusta and S.M.H. Wong, hep-ph/9909573.

[5] S.A. Bass, M. Belkacem et al, Prog. Part. Nucl. Phys. 41 (1998) 255.

[6] M. Bleicher, E. Zabrodin et al, J. Phys. G 25 (1999) 1859.

[7] S.M.H. Wong, Phys. Lett. B 480 (2000) 65.

[8] S.M.H. Wong, M. Belkacem, J.I. Kapusta, S.A. Bass, M. Bleicher, H. Stocker, hep-ph/0008119.