QUARK MATTER 2015
Sep. 27 – Oct. 3, 2015 Kobe, Japan

Contribution ID: **647** Type: **Poster**

Radiative 3<->2 transport and thermalization

Tuesday 29 September 2015 16:30 (2 hours)

The mechanism of rapid thermalization in heavy-ion reaction is still an open problem. While 2->2 perturbative QCD rates do not thermalize sufficiently fast (e.g., Molnar & Gyulassy anno 2000), it has been claimed a decade ago by Xu & Greiner using their BAMPS code that perturbative 3<->2 rates shorten thermalization time-scales in A+A at RHIC and LHC energies to 1 fm/c or smaller. Later it has been argued, however, (e.g., Deng et al) that the BAMPS calculation may have missed the rates by a factor of 3!=6. We investigate the thermalization question using the transport code MPC/Grid, which algorithmically is quite similar to BAMPS (it has scatterings implemented via sampling test particles in small spatial cells in discrete timesteps). The new code has been verified against every analytic test we could think of, and in 2->2 mode also against earlier A+A results from the geometric MPC/Cascade code. On one hand, we do find that the inclusion of 3<->2 rates speeds up thermalization very significantly, however, the rates are still not as high as those published from BAMPS. The difference in 3<->2 rates, however, is not simply a factor of 6 even when we try to reproduce their calculation exactly. On the other hand, we do find that the 3<->2 rates are very sensitive to how screening and the LPM effect are implemented. Results from MPC/Grid for collective flow in A+A reactions will also be discussed.

Author: MOLNAR, Denes (Purdue University)

Co-author: HEMPHILL, Dustin (Purdue University)

Presenter: MOLNAR, Denes (Purdue University)

Session Classification: Poster Session

Track Classification: Initial State Physics and Approach to Equilibrium