Proton and deuteron distributions at the RHIC

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Within the framework of the transport model RQMD(v2.4), we presented proton and deuteron (and their anti-particles) rapidity distributions, mean transverse momentum and freeze-out time distributions, from the central ($b \leq 3$fm) Au+Au collisions at $\sqrt{s} = 200$AGeV. Baryon stoping, collective expansion and freeze out sequences are discussed.

Questions we would like to address in this note:

- What are proton and deuteron rapidity distributions look like at the RHIC energy?
  Nuclear stopping power,
  ratios of $dN/dy(d)/(dN/dy(p))^2$, $dN/dy(\bar{p}))/dN/dy(p)$,...
- Do deuterons show any collective flow effect?
- Do deuterons freeze out earlier or later compared to protons?
- Are all above questions related to STAR?

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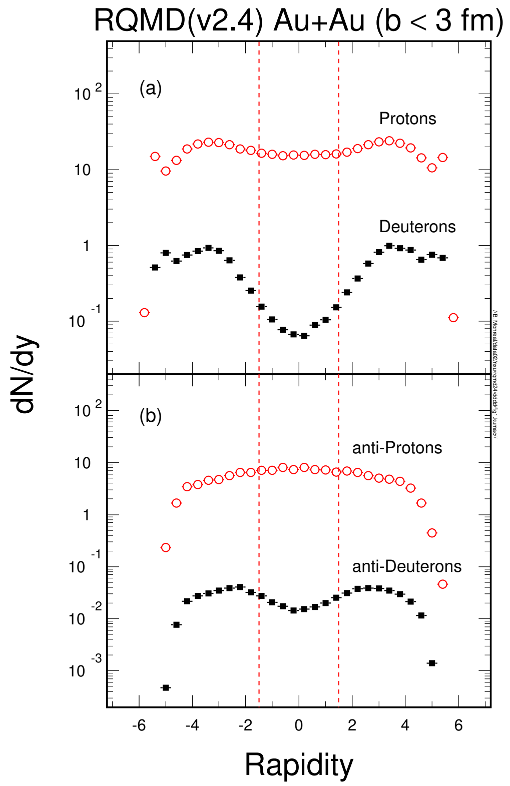

FIG. 1. Rapidity distributions of (a) protons (open circles) and deuterons (filled squares); (b) anti-protons (open circles) and anti-deuterons (filled squares), from central Au+Au collisions. The STAR TPC acceptance is indicated by the dashed lines.

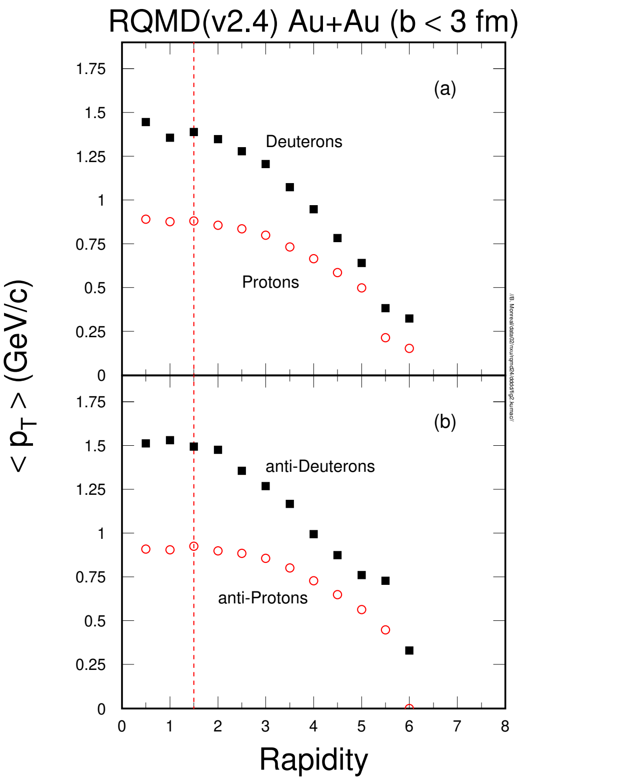

FIG. 2. The RQMD(v2.4) model prediction of the mean p_T as a function of rapidity for protons and deuterons and their anti-particles.

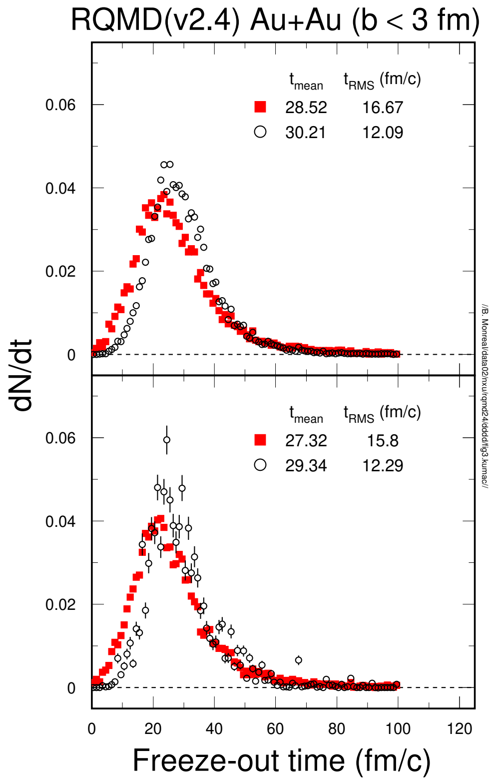

FIG. 3. Freeze-out time distributions of protons and deuterons and their anti-particles. Evidently that deuterons (anti-deuterones) are freeze-out later for about 2 fm/c than protons (anti-protons).