Dear code comparison participants,

As discussed in the Trento workshop on the "Challenges to Transport Models", we decided to branch out the comparison/predictions to SpiRIT experimental results as a project that I will coordinate. The evaluation group will continue on with the more precisely controlled box code comparisons and the HIC-pion comparison one issue at a time.

The goal of this "HIC prediction" project is to establish the uncertainties in the code outcomes before publication of the data. This will show the existing spread of uncertainties which will (hopefully) improve with time given the dedicated hard work of everyone. Contrary to previous homework, we will not fix input parameters. Instead, we encourage the participants to use his or her code with best physics and preferable with momentum dependence and include implementation of improvements and lessons learned from previous code comparisons. Use realistic physical input for isoscalar mean field, cross sections, and three choices of the symmetry energy etc. My suggestion of statistics is 200,000 collisions per configuration. You can judge from the statistics of the plots what is best for your case.

Description of the assignment is as follow:

Reactions: 132Sn+124Sn & 108Sn+112Sn @ E/A=270 MeV and b=3 fm with 3 different forms of S(rho) similar to S(rho) (MeV) =12.3*(rho/rho_0)^0.667+20*(rho/rho_0)^gamma where gamma =0.5, 1 and 2. See figure below this message. (You can use your own form of S(rho) most appropriate for your code.)

Output observables: Mandatory: Pi- & pi+ energy spectra in center of mass bins of 10MeV. Energy spectra should extend to 250-300 MeV. All plots should be in the center-of-mass frame. Optional are plots that can be generated from the energy spectra such as pi-/pi+ ratios as function of Ek for 132+124 & 108+112 separately, double ratios and Isoscaling ratios for pi- & pi+.

Input parameters: Use the most realistic input parameters for your code. Include in the communications the symmetry energy functions used in the simulations, plots for symmetry energy as function of density, and brief descriptions of the input parameters to the code.

Send plots and numbers of the above observables and input parameters to tsang@nscl.msu.edu before July 15, 2019.

Please also check the stability of your initial systems and check to use a sufficiently small time step so that the results for the 270 AMeV Sn+Sn system has reasonably converged. These are some of the "small" things that often tripped up the previous comparisons.

My preference would be if you can first send results (plots) with near linear symmetry energy dependence (gamma=1) to me as soon as possible to check if there are other issues with the simulations before continuing on with more simulations. I will try to respond within 48 hrs. Also, it is best if everyone can send me the outputs (plots and numbers on the plots) by end of June so that I can make a first attempt to compile the results from all the different codes in case we have to redo some calculations and more importantly to understand issues that arise from the homework.

Please save all simulation output files as we will look at charged particle observables such as particle ratios and flow once the data becomes available. We may also ask for the actual output file from your code if it is needed to ensure uniform analysis or if we want to impose certain gates. Please save

everything. If you run out of storage space, let me know. Also contact me if you need CPU resources to complete the homework in a timely manner.

All comments and questions should be directed to me. Of course, members of the writing group will be happy to answer your questions.

Thank you
Betty Tsang