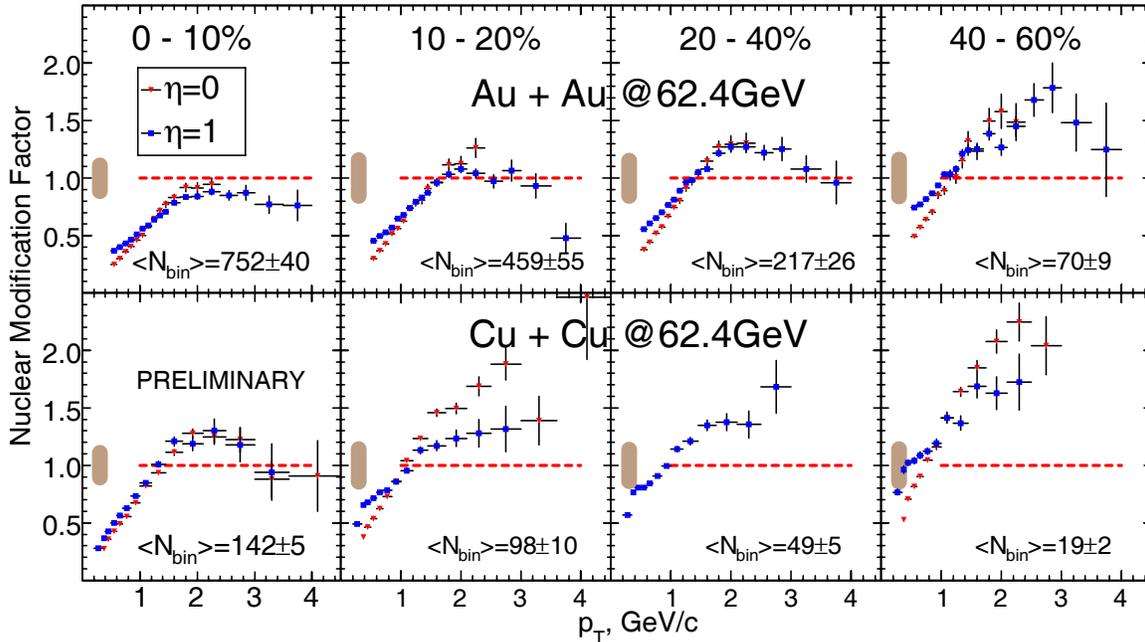


## Progress in BRAHMS

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BRAHMS measured Cu + Cu collisions at  $\sqrt{s_{nn}} = 200$  GeV and  $\sqrt{s_{nn}} = 63$  GeV as well as p + p collisions at  $\sqrt{s_{nn}} = 200$  GeV during RHIC Run-V. The Cu + Cu measurement provides for a mass and energy variation to compare to the Au + Au measurements at both energies. The measurement of p + p collisions provides a substantial improvement in statistics for the baseline measurement especially in the forward direction. The mass and energy variation is expected to help to disentangle the effects of jet quenching; where the energy loss  $\propto$  multiplicity, or A, and gluon saturation, where the saturation scale  $Q_s$  varies as  $A^{1/6}$ . We made measurements concentrating on high  $p_t$  as well as a study of the soft physics by measuring rapidity distributions over the entire range from mid-rapidity to near  $y=4$ .

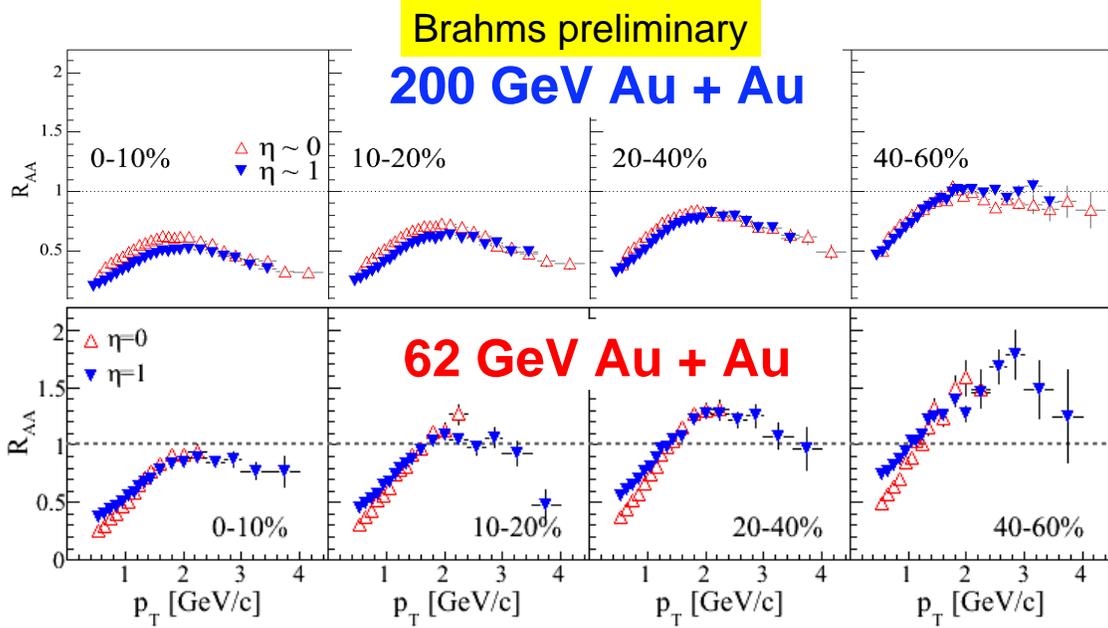
Preliminary results of the jet suppression from the low energy Cu + Cu data have been extracted. These preliminary results are shown in figure 1 where the  $R_{AA}$  of 62 GeV Cu + Cu is compared to  $R_{AA}$  of 62 GeV Au + Au. We note that the suppression of 62 GeV Cu + Cu for given centrality is less than that of 62 GeV Au + Au. It is also noted that where there is a region of rough overlap of the average number of binary collisions, that the suppression for the two energies is similar with the bins of lower average binary collisions of the Cu + Cu displaying the least suppression.



**Figure 1.** Comparison of  $R_{AuAu}$  and  $R_{CuCu}$  at 62.4 GeV for different centralities. The number of estimated binary collisions is shown in the bottom of each panel.

We have also continued the analysis of the earlier runs, particularly the Au + Au system at  $\sqrt{s_{nn}} = 200$  GeV and  $\sqrt{s_{nn}} = 63$  GeV. In figure 2 we compare the  $R_{AA}$  for Au + Au at 200 and 62.4 GeV.

We observe that the degree of suppression at 62.4 GeV is much less than at 200 GeV for all centralities. The degree of suppression increases with increasing centrality for both energies. As in the comparison between Au + Au and Cu + Cu, little difference between  $\eta=0$  and  $\eta=1$  is observed.



**Figure 2.** Comparison of  $R_{AA}$  at 200 and 62.4 GeV for different centralities.

We are spending significant effort to extract the spectra of all charged particles for all of the systems studied. This has required a reevaluation of all of the acceptances, efficiencies and corrections as the experiment has evolved especially in the forward direction during the later high statistics runs. These reevaluations are in progress and are well along. Once completed, they will aid in evaluating the suppression in the forward direction.

Our local group continues the analysis of the p + p data as well as providing a substantial contribution to the infrastructure of the experiment especially in software. We have taken charge of the calibration of the vertex counters as well as the time of flight hodoscopes for RHIC Run-V. We are currently working on a high statistics analysis of the p + p spectra of pions, kaons and protons. It is also necessary for this run to evaluate acceptances and corrections for the different counters which were inserted for the p + p running. These efforts are in progress and results should be available soon.