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Forward nuclear modification factor in Au-Au and Cu-Cu collisions at $\sqrt{s} = 62.4$ GeV

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The high p_T particles (e.g. mesons with $p_{\mathrm{T}} > 2$ GeV/c) from 200 GeV Au-Au collisions are produced from initial hard scattered partons. The hard scattered partons probe the final stages of the created medium before the parton fragments. Studying high p_{T} particles can then give information on the final state effects of the created medium. The nuclear moodification factor, ratio of nucleus-nucleus particle yields scaled by the number of binary collisions to p+p yields, shows suppression of the high p_T particles in central collisions but no dependence on pseudorapidity [1]. In addition, R_{CP}, binary collision scaled ratio of central to peripheral spectra, at the same energy does not depend on pseudorapidity. At midrapidity in 62.4 GeV Au-Au and Cu-Cu collisions, it has been shown that central collisions show no suppression or enhancement of the high p_{T} particles, while semi central collisions show Cronin enhancement [2]. At this lower energy, high p_{T} particle production can be studied in the fragmentation region. This could reveal interesting physics for models, such as the Color Glass Condensate and Recombination[3].
Collisions at 62.4 GeV can be used to span the data from SPS to RHIC, and constrain models spanning this energy regime. Hadron spectra were measured from the p+p collisions at $\sqrt{s_{NN}} = 62.4$ GeV in June 2006 from midrapidity out to the fragmentation region, a unique feature of BRAHMS. These results extends the baseline measurements for the exploration of medium effects in heavy ion collisions.
In the talk I will present nuclear modification factors at forward rapidity for Au-Au and Cu-Cu collisions using recent p+p collisions as reference data. Dependence on the system size will be investigated through a ratio of Au-Au and Cu-Cu yields scaled be the respective number of binary collisions, R_{AuCu}. The R_{AuCu} and the high p_{T} suppression's dependence on pseudorapidity will be presented in this talk.

References

[1] I. Arsene *et al*, BRAHMS Collaboration, Phys. Rev. Lett. **91**, 072305 (2003)
[2] B. Alver *et al*, PHOBOS Collaboration, Phys. Rev. Lett. **96**, 212301 (2006)
[3] R. C. Hwa and C. B. Yang, *http://arXiv.org/abs/nucl-th/0605037* (2006)