

CONF-9605180--8

 $\Lambda$  PRODUCTION IN AU-AU COLLISIONS AT THE AGS

A.C. SAULYS

for the E891 Collaboration

S. Ahmad<sup>d</sup>, B.E. Bonner<sup>d</sup>, C.S. Chan<sup>b</sup>, J.M. Clement<sup>d</sup>, S.V. Efremov<sup>d</sup>, E. Efstathiadis<sup>b</sup>, S.E. Eisman<sup>a</sup>, A. Etkin<sup>a</sup>, K.J. Foley<sup>a</sup>, R.W. Hackenburg<sup>a</sup>, M.A. Kramer<sup>b</sup>, S.J. Lindenbaum<sup>a,b</sup>, R.S. Longacre<sup>a</sup>, W.A. Love<sup>a</sup>, J. Marx<sup>c</sup>, G.S. Mutchler<sup>d</sup>, E.D. Platner<sup>d</sup>, A.C. Saulys<sup>a</sup>, L.S. Schroeder<sup>c</sup>, H.W. Themann<sup>d</sup>, K. Zhao<sup>b</sup>, Y. Zhu<sup>b</sup>

<sup>a</sup> Brookhaven National Laboratory, Upton, NY 11973, USA<sup>b</sup> City College of New York, NY 10031, USA<sup>c</sup> Lawrence Berkeley National Laboratory, Berkeley, CA 94720, USA<sup>d</sup> Rice University, Houston, TX 77251, USA

RECEIVED

APR 18 1997

OSTI

The results of a measurement of  $\Lambda$  production in Au-Au collisions at 11.6 A GeV/c by Experiment 891 at the Brookhaven AGS are presented. The measurements cover the rapidity region of 2.0 to 3.2 and transverse momenta of 0.0 to 1.4 GeV/c. The results are compared with similar measurements of Si-Si interactions and the predictions of ARC and RQMD models.

## 1 Experimental method and results

The apparatus for this experiment is similar to that used in an earlier experiment<sup>1</sup>. It is based on charged track reconstruction in TPC. We used the charged track multiplicity for centrality selection. The trigger cross section for this data sample was 270 mb. In fig. 1a we present the  $\Lambda$  transverse mass distributions and in fig. 1b we present the  $\Lambda$  rapidity distributions with the predictions of the ARC<sup>4</sup> and RQMD<sup>5</sup> models for impact parameters 0-4 fermi. We used a global fit to the data points in fig. 1a of the form  $A \cdot \exp((a + b \cdot \cosh(y - y_0)) \cdot m_t + c \cdot (y - y_0)^2)$  where  $A$  is an arbitrary constant and  $a, b, c$  are independent of rapidity. We scaled the  $\Lambda$  production<sup>2</sup> from Si + Si using the  $\Lambda/K_s^0$  ratio and the  $K^+ + K^-$  data<sup>3</sup> from Au + Au.

## 2 Conclusions

In summary, our measured  $\Lambda$  rapidity distribution for Au + Au central interactions agrees with the scaling of Si + Si measurements<sup>2</sup> and with the predictions of the ARC model. The transverse mass distributions become less steep at mid-rapidity compared to the Si + Si measurements or the predictions of ARC and RQMD models.

MASTER

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

ph

### **DISCLAIMER**

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, make any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

**DISCLAIMER**

**Portions of this document may be illegible  
in electronic image products. Images are  
produced from the best available original  
document.**

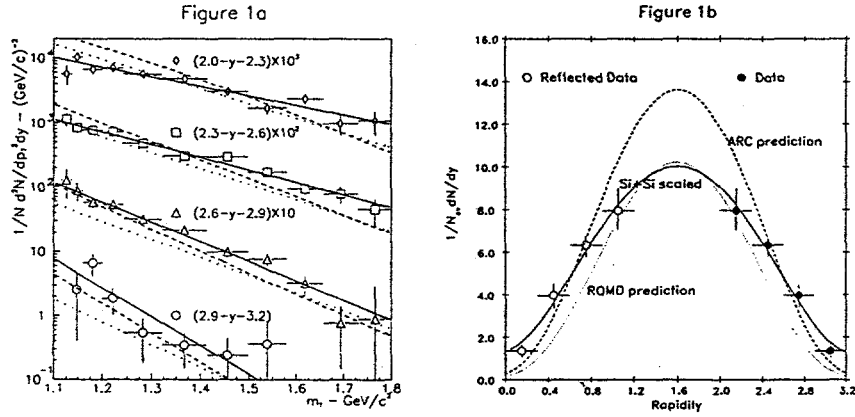


Figure 1: a) Transverse mass ( $m_t$ ) distributions for  $\Lambda$ 's. Each rapidity range has been scaled up by a factor of 10 as shown in the legend on the plot. The solid lines for  $2.0 < y(\Lambda) < 2.9$  are fits to the points and for  $2.9 < y(\Lambda) < 3.2$  the solid line is the result of the global fit described in the text. Errors shown are statistical only. b) Rapidity distribution for  $\Lambda$ 's. The solid curve is the result of scaling  $Si + Si$  data as explained in the text. The dashed lines are the ARC predictions and the dotted lines are the RQMD predictions in both figures.

### Acknowledgments

This research was supported by the U.S. Department of Energy and the City University of New York PSC-BHE Research Award Program. We wish to thank the members of the AGS department and the MPS staff for their support during this experiment. We thank D. Kahana for providing us with events from the ARC model. We are grateful to H. Sorge for access to the RQMD code and advice on running it.

### References

1. S.E. Eiseman, et al., *Phys. Lett. B* 248, 254 (1990).
2. S.E. Eiseman et al., *Phys. Lett. B* 297, 44 (1992).
3. F. Vidabaek for E802 collaboration, *Nucl. Phys. A* 590, 249c (1995).
4. Y. Pang et al., *Phys. Rev. Lett.* 68, 2743 (1992); S. Kahana et al., Physics at the AGS with a Relativistic Cascade, in: *Heavy-Ion Physics at the AGS* (MIT, Jan. 1993) p. 263.
5. H. Sorge, *Phys. Rev. C* 52, 3291 (1995); *Nucl. Phys. A* 590, 571c (1995).