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Thermal Analysis of Heavy Ion Collisions LAURA STILES, University of Kansas — At Brookhaven National Laboratory, the Relativistic Heavy Ion Collider accelerates heavy ions and protons to relativistic speeds to create extreme condition collisions. Detectors study these collisions, the ultimate goal being the study of a new form of matter, the quark-gluon plasma. One of the detectors, BRAHMS, or the Broad Range Hadron Magnetic Spectrometer, measures only a small number of particles, but over a wide range of momentum and angles. One question being studied is if different regions of the hot partonic matter created in these collisions loose causal contact with each other before they reach chemical equilibrium. A thermal model package, THERMUS, has been created that can be run in the object oriented data analysis framework, ROOT. THERMUS is a C++ implementation of the grand canonical ensemble, where charge, baryon number and strangeness are conserved on average. BRAHMS data of the ratios of different particles produced in collisions, are entered in, along with six parameters, chemical freeze out temperature, baryon number, strangeness and electric chemical potentials, fireball volume, and saturation factor. When the other parameters are given fixed values, T, muB, and muS are fit to the lowest value of chi square. The results from THERMUS show that as we move to more forward angles, both the strange quark chemical potential baryochemical potential increase. We will compare our results to lower energy data from recent RHIC runs and experiment NA49 at CERN.

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