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Rapidity dependency of (Anti)-deuteron Coalescence in Au-Au collisions MICHAEL MURRAY, University of Kansas, BRAHMS COLLABORATION — The coalescence of protons and neutrons into deuterons is sensitive to the space-time extent of the baryon freeze-out region. The coalescence parameter and the phase space density recast the information contained in the proton and deuteron spectra into "chemical" and "dynamic" terms. The phase space density is sensitive to the chemical potential and the temperature of the system. The coalescence parameter B_2 can be interpreted in terms of a "volume of homogeniety" which depends upon the temperature of the system and the radial flow. The large rapidity and p_T coverage with good particle identification of the BRAHMS spectrometers allow us to measure the rapidity dependence of the volume, which is proportional to $1/B_2$, and the phase space density of the (anti)-proton source for central Au+Au collisions. We find that $B_2(p_T)$ is almost independent of rapidity and beam energy. Interpreting $1/B_2$ as a volume gives numbers that are very close to HBT data and a size which steadily drops with p_T. We find that $B_2(p_T)$ is the same for protons and antiprotons. The phase space density has a weak rapidity dependence but varies rapidily with energy. These results in conjunction with other forward rapidity data start to give us a picture of the longitudinal evolution of the source at RHIC energies. Supported by NSF CAREER award 0449913

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