Where do the nucleons go at RHIC? -
Rapidity dependent net-proton distributions in central Au+Au collisions at maximum RHIC energy

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One of the primary goals of RHIC is to create and explore a highly excited baryon-poor region created by nuclear collisions at extremely high energy. Various theoretical models predict different net-baryon (baryon $-$ anti-baryon) density distributions depending upon how the dynamics of baryon number transport is treated. In order to discriminate among the available models, measurements of rapidity dependence of the net-baryon density are necessary.

The BRAHMS experiment at RHIC uniquely measures identified charged hadrons over a broad range of rapidity and transverse momentum with two movable spectrometers. We present the first measurement of rapidity dependent net-proton (proton $-$ anti-proton) yields at several rapidities ($0 \leq y_{\mathrm{p}} \leq 3$) in central Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV. The results are compared to theoretical predictions and to other available data.