Simulations of Statistical Model Fits to RHIC Data[1] W.J. LLOPE, Rice University — The application of statistical model fits to experimentally measured particle multiplicity ratios allows inferences of the average values of temperatures, T, baryochemical potentials, μ_B, and other quantities at chemical freeze-out. The location of the boundary between the hadronic and partonic regions in the (μ_B,T) phase diagram, and the possible existence of a critical point, remains largely speculative. The search for a critical point using the moments of the particle multiplicity distributions in tightly centrality constrained event samples makes the tacit assumption that the variances in the (μ_B,T) values in these samples is sufficiently small to tightly localize the events in the phase diagram. This and other aspects were explored in simulations by coupling the UrQMD transport model to the statistical model code Thermus. The phase diagram trajectories of individual events versus the time in fm/c was calculated versus the centrality and beam energy. The variances of the (μ_B,T) values at freeze-out, even in narrow centrality bins, are seen to be relatively large. This suggests that a new way to constrain the events on the phase diagram may lead to more sensitive searches for the possible critical point.

W.J. Llope
Rice University

Date submitted: 11 Jan 2013