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Probing Medium Effects on Hadronization in Heavy Ion Collisions

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The first four years of studies of heavy ion collisions at the Relativistic Heavy Ion Collider (RHIC) at Brookhaven National Laboratory brought a number of exciting discoveries about the high temperature and energy density matter created in the collisions. Among those, one of the most significant observations is the hadron yield suppression at high transverse momenta ($p_T > 2 \text{ GeV}/c$) in central Au+Au collisions. Another discovery, unpredicted by theory, is that protons and anti-protons behave differently: no suppression is present at intermediate p_T (2 - 5 GeV/c). This “baryon anomaly” at RHIC invoked new theoretical frameworks to describe the hadronization process in the presence of quark-gluon plasma. A survey of experimental data on identified hadron yields, jet correlations, and elliptic flow in p+p, d+Au, and Au+Au collisions will be presented and compared to theoretical models with the goal to reveal the dynamics of the hadronization process and the effects of the underlying medium.