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Thermodynamics and jet-quenching in the quark-gluon plasma from an AdS/QCD model ELIAS LILLESKOV, SEAN BARTZ, Macalester College — The Anti-de Sitter Space/Conformal Field Theory Correspondence (AdS/CFT) has been used to study both hadronic dynamics and the thermodynamics and jet quenching behavior of the quark-gluon plasma created in heavy ion collisions. We attempt to connect the two regimes by adapting an AdS/QCD model previously used to study meson spectra to apply to the quark-gluon plasma. The model includes three fields: a dilaton to introduce confinement, and chiral and glueball condensates to reflect the zero-temperature dynamics. We dynamically solve the Einstein field equations to numerically determine the metric, which asymptotically describes an anti-de Sitter-Schwarzschild black hole solution. We then numerically calculate the temperature as a function of the black hole horizon location. Next, we determine the behavior of the entropy density, the speed of sound, and the jet quenching parameter as functions of the temperature. These quantities approach the behavior of a conformal plasma in the high temperature limit. The minimum of the temperature-horizon plot is interpreted as the plasma's deconfinement temperature, found to be 104 MeV.

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