



Figure 5.2: $R_{AA}^c(p_T)$ and $R_{AA}^b(p_T)$ predicted for central $Pb+Pb$ at LHC comparing AdS/CFT Eq. (5.1) and pQCD using the WHDG model [152] convolving elastic and inelastic parton energy loss. Possible initial gluon rapidity densities at LHC are given by $dN_g/dy = 1750$, from a PHOBOS [87, 403] extrapolation, or $dN_g/dy = 2900$, from the KLN model of the color glass condensate (CGC) [400]. The top two curves from pQCD increase with p_T while the bottom two curves from AdS/CFT slowly decrease with p_T . The AdS/CFT parameters here were found using the “obvious” prescription with $\alpha_{SYM} = .05$, $\tau_0 = 1 \text{ fm}/c$, giving $D = 3/2\pi T$ (abbreviated to $D = 3$ in the figure). Similar trends were seen for the other input parameter possibilities discussed in the text. The “(” and “)” denote momenta after which possible string theoretic corrections may need to be considered; the curves’ increasing transparency from “(” to “)” is meant to additionally emphasize this, see text.

giving $T^* \simeq T^{QCD}/3^{1/4}$, and to fit the coupling $\lambda = g_{SYM}^2 N_c \approx 5.5$ in order to reproduce the static quark-antiquark forces calculated via lattice QCD.

The string theoretic result for the diffusion coefficient used in the Langevin