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Bottomonia Suppression in Heavy-Ion Collisions from AdS/CFT

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We compute for the first time the suppression of bottomonia in a strongly coupled QGP and compare the results to those from a weakly coupled QGP and to data. Using imaginary time techniques we numerically determine the real and imaginary parts of the binding energy of ground state bottomonia in a potential computed from AdS/CFT and another computed from pQCD. We implement the complex binding energies in a suppression model to determine the $\Upsilon(1S)$ nuclear modification factor in $\sqrt{s}_{NN} = 2.76$ TeV Pb+Pb collisions. This simplest strong-coupling, p_T-independent potential leads to a significant oversuppression of $\Upsilon(1S)$ compared to data while the results from the pQCD-derived potential are consistent with data. We also investigate the validity of using complex heavy quark potentials from AdS/CFT for all quark separation r by independently computing the meson spectrum using semiclassical, rotating open strings attached to the D7-brane.

Apply to be
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Yes

Level for award
 (Hons, MSc,
   PhD, N/A)?

MSc

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