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**Heavy Quarkonia in Quark-Gluon Plasma**[1] CHEUK-YIN WONG, Physics Division, Oak Ridge National Laboratory & University of Tennessee, Knoxville, TN — Does the $Q$-$\bar{Q}$ potential from lattice gauge data yield a $J/\psi$ dissociation temperature $\sim$1.6 $T_c$ as in lattice spectral function analyses? Is there a strong coupling between a static $Q$ and $\bar{Q}$ in their color-singlet states in the quark-gluon plasma? From a variational principle, we find the color-singlet $Q$-$\bar{Q}$ potential to be $f_F F_1 + (1 - f_F)U_1$, where $F_1$ is the lattice gauge color-singlet free energy, $U_1$ the internal energy, $f_F = 3/(3 + a(T))$, and $a(T)$ =3(pressure)/(energy density) is from the equation of state. We find that $J/\psi$ dissociates spontaneously above 1.56 $T_c$, while $\chi_c$ and $\psi'$ are unbound in the quark-gluon plasma. Our analysis lends support to the theoretical result that $J/\psi$ is bound up to $\sim$1.6 $T_c$. However, $J/\psi$ has a binding energy $\sim$ 0.04 GeV at 1.13 $T_c$, indicating that the coupling between a static $Q$ and $\bar{Q}$ in their color-singlet states is quite weak in the quark-gluon plasma. For details, please browse http://www.arxiv.org/pdf/hep-ph/0408020.

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Cheuk-Yin Wong
Oak Ridge National Laboratory

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