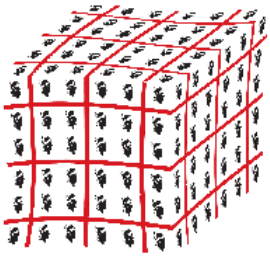

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Charmonium-Nucleon potential from lattice QCD

Friday, 18 June 2010 14:30 (20 minutes)

Low energy charmonium-nucleon interaction is of particular interest in this talk. The heavy quarkonium state such as the charmonium($c\bar{c}$) state does not share the same quark flavor with the nucleon so that $c\bar{c}$-nucleon interaction might be described by the gluonic van der Waals interaction, which is weak but attractive. Therefore, the detail information of $c\bar{c}$-nucleon interaction is vital for considering the possibility of the formation of charmonium bound to nuclei. We will present the results for $c\bar{c}$-nucleon potential from quenched lattice QCD, which is defined from the equal-time Bethe-Salpeter amplitude with local interpolating operator for the charmonium and nucleon. A $c\bar{c}$-nucleon potential is required for precise prediction of the binding energy of nuclear-bound charmonium in exact few body calculations. Through a study of the η_c-nucleon interaction at low energy, we have found that $V_{c\bar{c}N}(r)$ is attractive at short distances and screened at long distances. Our simulations are performed at a lattice cutoff of $1/a = 2.0$ GeV in a spatial volume of $(3\text{fm})^3$ with the nonperturbatively $O(a)$ improved Wilson action for the light quarks and a relativistic heavy quark action for the charm quark. We will show new results of the $c\bar{c}$-nucleon potential from full QCD simulation using 2+1 flavor PACS-CS configuration as well.

Please, insert your presentation type (talk, poster)

talk

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