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Charmonium-Nucleon Interaction from Quenched Lattice QCD with Relativistic Heavy Quark Action TAICHI KAWANAI, SHOICHI SASAKI, TETSUO HATSUDA, The University of Tokyo — Low energy charmonium-nucleon interaction is of particular interest in this talk. A heavy quarkonium state like the charmonium 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 information of the strength of $c\bar{c}$-nucleon interaction is vital for considering the possibility of the formation of charmonium bound to nuclei. We will present the preliminary results for the scattering length and the interaction range of charmonium-nucleon s-wave scattering from quenched lattice QCD. These low-energy quantities can provide useful constraints on the phenomenological $c\bar{c}$-nucleon potential, which is required for precise prediction of the binding energy of nuclear-bound charmonium in exact few body calculations. Our simulations are performed at a lattice cutoff of 1/a=2.0 GeV with the nonperturbatively O(a) improved Wilson action for the light quark and a relativistic heavy quark action for the charm quark. A new attempt of calculating the $c\bar{c}$-nucleon potential through the Bethe-Salpeter wave function will be also discussed.

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