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Low energy charmonium-nucleon scattering with twisted boundary conditions

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We study the charmonium-nucleon interactions at low energies by extended Lüscher formula with partially twisted boundary conditions, which allows us to calculate the s -wave phase shift at any small value of the relative momentum even in a finite volume. Our exploratory studies are carried out in quenched lattice QCD with non-perturbatively $O(a)$ -improved Wilson fermions for light quarks and a relativistic heavy quark action for charm quark.

We have successfully evaluated both scattering lengths and effective ranges of η_c -nucleon and J/ψ -nucleon through this new approach. We also report on preliminary results calculated on 2+1 flavor PACS-CS configuration.

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talk

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