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## Dbar-N interaction from Lattice QCD at physical point

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The Dbar-N two-body system is one of the simplest and most important systems involving the charmed meson and nucleons. Because of the absence of quark-antiquark annihilation, the Dbar-N channel is entirely exotic so that a bound state would be a pentaquark state. In addition, an understanding of the Dbar-N interaction is sorely needed for studies of charmed nuclei and in-medium D-meson properties. However, the Dbar-N interaction has yet to be known in detail. While some EFT models predict a strong attraction forming a bound state, other models predict a weak attraction or repulsion [1]. Given this circumstance, realistic lattice QCD simulations could play an important role in guiding future theoretical studies involving the Dbar-N interaction.

In this talk, I will present preliminary results of the Dbar-N interaction and its scattering properties obtained from (2+1)-flavor lattice QCD simulations at physical point, which utilize gauge configurations generated by the HAL Collaboration on a  $96^3 \times 96$  lattice with pion mass  $m_\pi \simeq 137$  MeV and lattice spacing  $a \simeq 0.0844$  fm [2].

References:

[1] J.Haidenbauer, G.Krein, U.-G.Meissner, A.Sibirtsev Eur. Phys. J. A33 (2007) 107–117; C.E. Fontoura, G. Krein, V.E. Vizcarra, Phys. Rev. C 87 (2) (2013) 025206; Y. Yamaguchi, S. Yasui, A. Hosaka, Phys. Rev. D 106, 094001 (2022)

[2] T. Aoyama et. al., (HAL QCD collaboration) arXiv:2406.16665

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