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The coupled channel approach to the $\Lambda_c N$ - $\Sigma_c N$ system in lattice QCD

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We investigate the 2-baryon system with the isospin $1/2$ including one charm quark, namely, $\Lambda_c N$ and $\Sigma_c N$. Although this system is similar to the ΛN and ΣN system, the interaction of this charmed 2-baryon system above $\Sigma_c N$ threshold might be quite different from its hyperon counter part, due to the smaller mass splitting between Σ_c and Σ_c^* than Σ and Σ^* , which is consequence of the heavy quark spin symmetry. To explore this possibility, we calculate the coupled channel potential for charmed 2-baryon system using the HAL QCD method in lattice QCD. To avoid the discretization error coming from the heavy quark mass, we employ the Relativistic Heavy Quark (RHQ) action for the charm quark. The purpose of this talk is to present our latest results and to discuss the nature of the interaction in the charmed 2-baryon system including a possibility on the existence of bound or resonance states.

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