



Nuclear Theory

Sigma_c Dbar and Lambda_c Dbar states in a chiral quark model

W.L. Wang, F. Huang, Z.Y. Zhang, B.S. Zou

(Submitted on 3 Jan 2011)

The S-wave Sigma_c Dbar and Lambda_c Dbar states with isospin $I=1/2$ and spin $S=1/2$ are dynamically investigated within the framework of a chiral constituent quark model by solving a resonating group method (RGM) equation. The results show that the interaction between Sigma_c and Dbar is attractive, which consequently results in a Sigma_c Dbar bound state with the binding energy of about 5-42 MeV, unlike the case of Lambda_c Dbar state, which has a repulsive interaction and thus is unbound. The channel coupling effect of Sigma_c Dbar and Lambda_c Dbar is found to be negligible due to the fact that the gap between the Sigma_c Dbar and Lambda_c Dbar thresholds is relatively large and the Sigma_c Dbar and Lambda_c Dbar transition interaction is weak.

Comments: 7 pages, 2 figures

Subjects: **Nuclear Theory (nucl-th)**; High Energy Physics - Phenomenology (hep-ph)

Journal reference: Phys.Rev.C84:015203,2011

DOI: [10.1103/PhysRevC.84.015203](https://doi.org/10.1103/PhysRevC.84.015203)

Cite as: [arXiv:1101.0453](https://arxiv.org/abs/1101.0453) [nucl-th]

(or [arXiv:1101.0453v1](https://arxiv.org/abs/1101.0453v1) [nucl-th] for this version)

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