

$Y_c N$ bound and resonance states in the potential model

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$\Lambda_c N$, $\Sigma_c N$ and $\Sigma_c^* N$ bound and resonance states are studied in the meson-exchange potential with a short-range repulsion coming from the quark structure of baryons. Our potential consists of OBEP [1] and QCM repulsion [2].

First, we construct the $Y_c N$ potential models according to [1] [2]. Since there are not scattering data of charmed baryons, we determine the parameters to reproduce the experimental data of a well-known system. In this study, we adopt NN system as the well-known system. We apply the Gaussian Expansion Method [3] [4] to solve the $Y_c N$ system with channel couplings using the constructed potential.

We find shallow bound states for the deepest potential obtained in the above construction. We also find resonance states around $\Sigma_c N$ and $\Sigma_c^* N$ thresholds by using the real scaling method [4]. We currently apply the complex scaling method to confirm the existence of the resonances.

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