

## Low energy reaction $K^-p$ and the negative parity resonances

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The reaction  $K^-p \rightarrow \eta$  at low energies is studied with a chiral quark model approach. Good descriptions of the existing experimental data are obtained. It is found that  $(1670)$  dominates the reaction around threshold. Furthermore, u- and t-channel backgrounds play crucial roles in this reaction as well. The contributions from the D-wave state  $(1690)$  are negligibly small for its tiny coupling to  $\eta$ . To understand the strong coupling properties of the low-lying negative parity resonances extracted from the  $\bar{K}N$  scattering, we further study their

strong decays. It is found that these resonances are most likely mixed states between different configurations. Considering these low-lying negative parity resonances as mixed three-quark states, we can reasonably understand

both their strong decay properties from Particle Data Group and their strong coupling properties extracted from the  $\bar{K}N$  scattering. As a byproduct, we also predict the strong decay properties of the missing D-wave state  $|3$

$2$

$-\frac{1}{2}$  with a mass of  $\sim 1.8$  GeV. We suggest our experimental colleagues search it in the  $(1385)\pi$  and  $\pi$  channels.

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