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Predictions of mass spectra for light hybrid baryons

We study the mass spectra of the nucleon and delta hybrid baryons within the method of parity-projected QCD sum rules. The stable QCD sum rules can be established for the positive-parity $N_{1/2^+}$, $\Delta_{3/2^+}$, $\Delta_{1/2^+}$ and negative-parity $N_{1/2^-}$, $N_{3/2^-}$, $\Delta_{1/2^-}$ channels to extract their masses. The lowest-lying hybrid baryons are predicted to be the negative-parity $N_{1/2^-}$ state around 2.28 GeV and $\Delta_{1/2^-}$ state around 2.64 GeV. These hybrid baryons mainly decay into conventional baryon plus meson final states. We propose to search for thees hybrid baryons through the χ_{cJ}/Υ decays via the three-gluon emission mechanism in BESIII and BelleII experiments.

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