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Quantum Monte Carlo studies of pentaquark states MARK PARIS, Jefferson Lab — We study states of four light quarks of isospin zero and a strange antiquark for a variety of wave functions with a non-relativistic constituent quark model (NRCQM) whose parameters are fixed from light baryon spectroscopy. The many-body Schrodinger equation is solved using the variational Monte Carlo technique. Improvements over previous NRCQM include full antisymmetrization of the state of the four light quarks, sometimes neglected, relaxed assumptions for the spin state of the four light quarks, and the inclusion of correlations between pairs of quarks which depend on their isospin-spin-color state. Masses are calculated for negative and positive parity pentaquark states and found to be considerably higher than 1.5 GeV. The structure of the wave function is studied in terms of short range correlations.

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