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Investigating excited Omega_c states from pentaquark perspective

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Inspired by the recent observation of new \Omega_c states by the LHCb Collaboration, we explore the excited Omega_c states from the pentaquark perspective in the quark delocalization color screening model. Our results indicate that the \Omega_c(3185) can be well interpreted as a molecular \Xi D predominated resonance state with J^P = 1/2^−. The \Omega_c(3120) can also be interpreted as a molecular \Xi_c^ *bar{K} state with J^P = 3/2^− and a new molecular state \Xi_c^* \bar{K}^** with J^P = 5/2^− and a mass of 3526 MeV is predicted, which is worth searching in the future. Other reported \Omega_c states cannot be well described in the framework of pentaquark systems in the present work. The three-quark excited state or the unquenched picture may be a good explanation,which is worth further exploration.

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