The hidden-charm pentaquark and tetraquark states

Shi-Lin Zhu[1]
[1]Peking University

Since 2003 many charmonium-like states were observed experimentally. Especially those charged charmonium-like Zc states and bottomonium-like Zb states cannot be accommodated within the naive quark model, which are good candidates of either the hidden-charm tetraquark states or molecules composed of a pair of charmed mesons. Last year, the LHCb Collaboration discovered two hidden-charm pentaquark states, which are also beyond the quark model. In this talk, we review the current experimental progress and investigate various theoretical interpretations of these candidates of the multiquark states. We list the puzzles and theoretical challenges of these models when confronted with the experimental data. We also discuss possible future measurements which may distinguish the theoretical schemes on the underlying structures of the hiddencharm multiquark states.