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Mitsuyoshi Tanaka Dissertation Award Talk: Exotic states in B decays

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Since the Quark Model came into being in the 1960's, it has been enormously successful in classifying the known hadrons. These hadrons have historically fallen neatly into the categories of three-quark baryons or quark-antiquark mesons. Yet even since the existence of quarks was first proposed, it has been suggested that they could be arranged into other configurations, such as two quarks and two antiquarks (tetraquarks), or four quarks and an antiquark (pentaquarks). There is no known reason why such "exotic" combinations of quarks such as these should not exist, and indeed in recent years a number of strong tetraquark candidates have been found. These were followed by two pentaquark candidates, $P_c(4380)$ and $P_c(4450)$, whose findings made up the bulk of the work for which this Tanaka Dissertation Award was given. An overview of this work will be given, followed by a review of recent LHCb results in the field of exotic hadrons.