

New observations in charmonium decays at BESIII

This presentation will explore recent experimental findings in the domain of charmonium decays, encompassing four independent measurements conducted at BESIII. 1) Utilizing 27B $\psi(3686)$ events collected with the BESIII detector, various hc decays have been sought and measured. The decay channel $hc \rightarrow 3(\pi^+\pi^-)\pi^0$ has been observed for the first time, with strong evidence of $hc \rightarrow 2(\pi^+\pi^-)\pi^0\eta$ and $2(\pi^+\pi^-)\omega$. 2) The observation of the $\psi(3686) \rightarrow 3\phi$. This observation illuminates the rare decay process of the $\psi(3686)$ resonance into three phi mesons, providing valuable insights into the dynamics of charmonium decays. No significant structure is observed in the $\phi\phi$ invariant mass. 3) The search for $\eta_c(2S) \rightarrow \pi^+\pi^-\eta_c$ and $\eta_c(2S) \rightarrow \pi^+\pi^-K_s^0 K^+/\pi^-K^-$ decays. This study aims to explore the decay properties of the $\eta_c(2S)$ meson, offering new perspectives on its decay modes and contributing to our understanding of charmonium states. 4) The observation of $\chi_{cJ} \rightarrow 3(K^+K^-)$. All the decays from χ_{c0} , χ_{c1} , and χ_{c2} are observed for the first time.

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