

Measurements of charmonium decays from BESIII

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This presentation will cover the branching fraction measurements of $\chi_{cJ} \rightarrow \phi \phi$ ($J=0,1,2$), $\eta_c(2S) \rightarrow \pi^+ \pi^- \eta$, $\chi_{cJ} \rightarrow \Omega^+ \text{anti}\Omega^-$ ($J=0,1,2$), and $\psi(3770) \rightarrow \eta J/\psi$. The first three measurements are benefitted from the huge $\psi(2S)$ samples collected at BESIII and the transitions from $\psi(2S)$ to χ_{cJ} or $\eta_c(2S)$. The last one is based on $e^+ e^-$ annihilation data sample collected at c.m.s 3.773 GeV. The branching fractions of the decays $\chi_{cJ} \rightarrow \phi \phi$ ($J=0,1,2$) have been measured most precisely, and the polarization parameters of $\chi_{cJ} \rightarrow \phi \phi$ have been determined for the first time via a helicity amplitude analysis. The evidence of $\eta_c(2S) \rightarrow \pi^+ \pi^- \eta$ has been found in the decay sequence $\psi(3686) \rightarrow \gamma \eta_c(2S)$, $\eta_c(2S) \rightarrow \pi^+ \pi^- \eta$ for the first time. The decays $\chi_{cJ} \rightarrow \Omega^+ \text{anti}\Omega^-$ ($J=0,1,2$) have been observed for the first time with high significance, respectively, and the relevant branching fractions have been provided. The process $e^+ e^- \rightarrow \eta J/\psi$ at a center-of-mass energy 3.773 GeV is observed for the first time, its Born cross-section is measured, and the branching fraction of $\psi(3770) \rightarrow \eta J/\psi$ is determined by a combined fit with the cross-sections at other energy points, after considering the interference effect for the first time.

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