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Particle Production in Two-Photon Collisions at Belle

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- Experimental study of η production in two-photon collisions
The differential cross section for the process $\gamma\gamma \rightarrow \eta\eta$ has been measured in the kinematic range above the $\eta\eta$ threshold, $1.096 \text{ GeV} < W < 3.8 \text{ GeV}$, in almost the whole solid angle, $|\cos\theta| < 0.9$ or < 1.0 depending on W , where W and θ are the energy and η scattering angle, respectively, in the $\gamma\gamma$ center-of-mass system. This is the first measurement of the cross section for this process. The results are based on a 393 fb^{-1} data sample collected with the Belle detector at the KEKB e^+e^- collider. In the W range $1.1\text{--}2.0 \text{ GeV}/c^2$ we perform an analysis of resonance amplitudes for various partial waves; at higher energy we extract the contributions of χ_{cJ} charmonia and compare the energy and angular dependence of the cross section with the predictions of theoretical models.
- Observation of $\eta_c(2S)$ in six-prong final states produced in two-photon collisions
We report the observation of $\eta_c(2S)$, produced in two-photon collisions, and decaying to the six-prong final states $3(\pi^+\pi^-)$, $K^+K^-2(\pi^+\pi^-)$, and $K_S^0K^+\pi^-\pi^+\pi^-$ (including the charge-conjugate state). This analysis is based on a large data sample accumulated by the Belle experiment at the KEKB asymmetric-energy electron-positron collider. This is the first observation of decay modes of the $\eta_c(2S)$ other than $K_S^0K^+\pi^-$.

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