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Study of three-body charmonium decays in BABAR

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We study the reaction $e^+ e^- \rightarrow \gamma_{\text{ISR}} J/\psi$, where $J/\psi \rightarrow \pi^+ \pi^- \pi^0$, and $J/\psi \rightarrow K^+ K^- \pi^0$, using events obtained from the Initial State Radiation process. We measure the relative J/ψ branching fraction and perform a Dalitz plot analysis of both J/ψ decay modes using an isobar and a Veneziano model. We present also an analysis of the process $\gamma \gamma \rightarrow K \text{ anti-}K \pi$. We observe the decays $\eta_c \rightarrow K_S K^+ \pi^-$ and $\eta_c \rightarrow K^+ K^- \pi^0$ and perform a Dalitz analysis of both η_c decay modes. We also extract the mass dependent $K \pi$ S-wave amplitude and phase using a model-independent partial wave analysis approach. These studies have been performed using the entire BABAR dataset collected at the PEP-II e^+e^- collider.

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