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Studies with Initial State Radiation at BABAR

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- Initial State Radiation Physics Studies at BABAR
 We present recent results obtained at BABAR from low energy $e+e-$ annihilations, produced via initial state radiation. Low energy hadronic cross sections provide essential experimental input for calculating hadronic corrections to the muon anomalous magnetic moment, while studies of final states and intermediate structures with unprecedented accuracy can reveal new bound states and help elucidate their properties.
 We present new measurements of $e+e- \rightarrow K+K-\pi+\pi-$, $K+K-\pi^0\pi^0$, $2(K+K-)$ based on the full data set including investigations of signals from $\phi(1020)2\pi$ and $\phi(1020)f_0(980)$ intermediate states. The evaluation of $Y(2175) \rightarrow \phi f_0(980)$ parameters are presented along with measurements of the J/ψ and $\psi(2S)$ BFs to these final states. The BaBar measurement of $\pi^+\pi^-$ and other channels important for calculating the hadronic contribution to the muon magnetic moment anomaly will be discussed.
- Associated charm baryon production in Initial State Radiation events and measurements of the $Y(4260)$ state produced in $e+e-\rightarrow\gamma_{ISR} J/\psi \pi^+\pi^-$
 We present an analysis of a threshold enhancement observed in $(\Lambda_{c^+} \text{ anti-}\Lambda_{c^-})$ pairs produced in the reaction $e+e-\rightarrow\gamma_{ISR} \Lambda_{c^+} \text{ anti-}\Lambda_{c^-}$. This study uses data collected with the BABAR detector operating at the SLAC PEP-II B-factory. We also report on updated mass and width measurements for the $Y(4260)\rightarrow J/\psi \pi^+\pi^-$ produced in initial state radiation events using 454 fb^{-1} of BaBar data.

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