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Hadron spectroscopy and exotics (experiment and theory)
Experiment: DELPHI
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The $\eta_c(2980)$ formation in two-photon collisions at LEP energies

DELPHI Collaboration

Abstract

The $\eta_c(2980)$ production in $\gamma\gamma$ interactions has been detected via its decays into $K^0_s K^{\pm}\pi^{\mp}$, $K^+K^-K^+K^-$ and $K^+K^-\pi^+\pi^-$ in the data taken with the DELPHI detector at LEP. No direct decay channel $\eta_c \to \pi^+\pi^-\pi^+\pi^-$ has been observed.

The two-photon radiative width of the η_c is $\Gamma_{\gamma\gamma} = 13.3 \pm 2.6(stat.) \pm 2.0(syst.) \pm 3.5(BR)$ keV for $\eta_c \to K^0_s K^{\pm}\pi^{\mp}$ decay, $\Gamma_{\gamma\gamma} = 14.3 \pm 2.9(stat.) \pm 2.4(syst.) \pm 8.1(BR)$ keV for the $K^+K^-K^+K^-$ decay channel and $\Gamma_{\gamma\gamma} = 12.1 \pm 3.4(stat.) \pm 1.8(syst.) \pm 4.4(BR)$ keV for $\eta_c \to K^+K^-\pi^+\pi^-$. An upper limit $\Gamma_{\gamma\gamma} = 3.8$ keV at 95% confidence level has been evaluated for $\pi^+\pi^-\pi^+\pi^-$ decay m ode.

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