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## Measurement of $\eta_c(1S)$ , $\eta_c(2S)$ and non-resonant $\eta'$ $\pi^+ \pi^-$ production in two-photon collisions at Belle

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We report the measurements of  $\gamma\gamma \rightarrow \eta_c(1S)$ ,  $\eta_c(2S) \rightarrow \eta' \pi^+ \pi^-$  with  $\eta'$  decay to  $\gamma\rho$  and  $\eta \pi^+ \pi^-$  using 941 fb<sup>-1</sup> of data collected with the Belle detector at the KEKB asymmetric-energy  $e^+ e^-$  collider. First observation of  $\eta_c(2S) \rightarrow \eta' \pi^+ \pi^-$  with a significance 5.5  $\sigma$  including systematic error is obtained. The products of the two-photon decay width and branching fraction of decays to  $\eta' \pi^+ \pi^-$  are determined for the  $\eta_c(1S)$  and  $\eta_c(2S)$ , respectively. A new decay mode for the  $\eta_c(1S) \rightarrow \eta' f_0(2080)$  with  $f_0(2080) \rightarrow \pi^+ \pi^-$  is observed with a statistical significance of 20  $\sigma$ . The cross section for  $\gamma\gamma \rightarrow \eta' \pi^+ \pi^-$  and  $\eta' f_2(1270)$  are measured for the first time.

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