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Charmonium-like particles at Belle

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From a Dalitz plot analysis of $B \to K\pi^+\psi'$ decays, we find a signal for $Z(4430)^+ \to \pi^+\psi'$ with a mass $M = (4442^{+15+19}_{-12-13})$MeV/$c^2$, width $\Gamma = (107^{+86+74}_{-43-56})$ MeV, product branching fraction $\mathcal{B}(\bar{B}^0 \to K^- Z(4430)^+) \times \mathcal{B}(Z(4430)^+ \to \pi^+\psi') = (3.2^{+1.8+5.3}_{-0.9-1.6}) \times 10^{-5}$, and significance of 6.4σ that agrees with previous Belle measurements based on the same data sample. In addition, we determine the branching fraction $\mathcal{B}(B^0 \to K^*(892)^0\psi') = (5.52^{+0.35+0.53}_{-0.32-0.58}) \times 10^{-4}$ and the fraction of $K^*(892)^0$ mesons that are longitudinally polarized $f_L = (44.8^{+4.0+4.0}_{-2.7-5.3})\%$. These results are obtained from a large data sample collected near the $\Upsilon(4S)$ resonance with the Belle detector
at the KEKB asymmetric energy e^+e^- collider.

The CDF collaboration recently reported a narrow structure $Y(4341)$ near the $J/\psi\phi$ threshold with a statistical significance of 3.8 σ. A similar study is performed in the $B \to J/\psi\phi K^+$ mode to verify whether or not this new structure is present in Belle data.

We also have searched for a charmonium-like state in the process $\gamma\gamma \to \omega J/\psi$ in the mass region, 3.9-4.2 GeV/c^2. This may be related to one or more of the three charmonium-like states reported in the similar mass region.

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