

## Light particle searches at Belle

Thursday, July 16, 2009 4:30 PM (20 minutes)

We report on a search for the  $X(1812)$  state in the decay  $B^\pm \rightarrow K^\pm \omega \phi$  with a data sample of  $657 \times 10^6$   $B\bar{B}$  pairs collected with the Belle detector at the KEKB  $e^+e^-$  collider. No significant signal is observed. An upper limit  $calB(B^\pm \rightarrow K^\pm X(1812), X(1812) \rightarrow \omega \phi) < 3.2 \times 10^{-7}$  (90% C.L.) is determined. We also constrain the three-body decay branching fraction to be  $calB(B^\pm \rightarrow K^\pm \omega \phi) < 1.9 \times 10^{-6}$  (90% C.L.).

We also report on a search for a low mass particle with a mass of  $214.3 \text{ MeV}/c^2$  reported by the HyperCP experiment at Fermilab. For this search we use the following decay modes:  $B^0 \rightarrow K^- \pi^+ X^0$ ,  $X^0 \rightarrow \mu^+ \mu^-$ ;  $B^0 \rightarrow \pi^- \pi^+ X^0$ ,  $X^0 \rightarrow \mu^+ \mu^-$ ;  $B^0 \rightarrow K^{*0} X^0$ ,  $K^{*0} \rightarrow K^+ \pi^-$ ,  $X^0 \rightarrow \mu^+ \mu^-$ ; and  $B^0 \rightarrow \rho^0 X^0$ ,  $\rho^0 \rightarrow \pi^+ \pi^-$ ,  $X^0 \rightarrow \mu^+ \mu^-$ , where  $X^0$  is a pseudo-scalar particle with mass of  $214.3 \text{ MeV}/c^2$ .

We finally report a search for the  $X(1835)$  state via  $e^+e^- \rightarrow J/\psi X(1835)$  process with a data sample of  $673 \text{ fb}^{-1}$  collected on and off  $\Upsilon(4S)$  resonance with the Belle detector at the KEKB asymmetric-energy  $e^+e^-$  collider. As no significant signal is found for  $e^+e^- \rightarrow J/\psi X(1835)$  production, we measure an upper limit on its cross-section  $\sigma_{Born}[e^+e^- \rightarrow J/\psi X(1835)] \times [Br(X(1835) \rightarrow 2\text{charged})]$ .

**Primary author:** LIU, Chao (USTC)

**Presenter:** LIU, Chao (USTC)

**Session Classification:** VI. QCD in Hadronic Physics

**Track Classification:** QCD in hadronic physics