



Contribution ID: 1175

Type: Parallel Session Talk

Measurements of the CKM angle γ at BABAR

Friday, 23 July 2010 16:15 (13 minutes)

Using data from approximately 470 million B-Bbar pair events collected with the BaBar detector at SLAC's PEP-II e+e- B-factory running on the Upsilon(4S), we have made a number of measurements that are sensitive to the Cabibbo-Kobayashi-Maskawa CP-violating angle γ . These include a measurement of γ from a Dalitz Plot analysis of neutral D meson decays to $K^0_S \pi^+ \pi^-$ and $K^0_S K^+ K^-$ produced in the processes $B^{(+)} \rightarrow D K^{(++)}$, $B^{(+)} \rightarrow D^{\{0\}} K^{(++)}$ with $D^{\{0\}} \rightarrow D \pi^0, D^{\{0\}} \gamma$, and $B^{(+)} \rightarrow DK^{(++)}$ with $K^{(++)} \rightarrow K^0_S \pi^{(++)}$. We also search for b \rightarrow u transitions in $B^{\pm} \rightarrow D^0 K^{\pm}$ and $B^{\pm} \rightarrow D^{\{0\}} K^{\pm}$ decays which are sensitive γ due to interference between the b \rightarrow c transition $B^{\pm} \rightarrow D^{\{0\}} K^{\pm}$ followed by the doubly Cabibbo-suppressed decay $D^0 \rightarrow K^+ \pi^-$, and the b \rightarrow u transition $B^{\pm} \rightarrow D^{\{0\}} K^{\pm}$ followed by the Cabibbo-favored decay $\text{anti-}D^0 \rightarrow K^+ \pi^-$. We also analyze the decay $B^{\pm} \rightarrow D^{\{0\}} \pi^{\pm}$ with the D decaying into the doubly Cabibbo-suppressed mode $D \rightarrow K^+ \pi^-$. In addition we report on a measurement of the γ in $B^{(\pm)} \rightarrow D_{CP} K^{(\pm)}$ decays: from reconstructed $B^{(\pm)} \rightarrow D K^{(\pm)}$ decays, where the neutral D meson is reconstructed in both CP-eigenstate and non-CP-eigenstate final states, we measure the partial rate charge asymmetries for CP-even and CP-odd D final states and the ratios between the charge-averaged $B^{(\pm)} \rightarrow D K^{(\pm)}$ decay partial rates, where the D meson decays to CP and non-CP eigenstates. We infer frequentist confidence intervals for γ , for the strong phase δ_B , and for the amplitude ratio r_B , which are related to the $B^{(\pm)} \rightarrow DK^{(\pm)}$ decay amplitudes by $r_B e^{i(\delta_B - \gamma)} = A(B^{\pm} \rightarrow \overline{D^0} K^{\pm}) / A(B^{\pm} \rightarrow D^0 K^{\pm})$. We also report on the study of the decay $B^{\pm} \rightarrow D^{\{0\}} (\overline{D^0} K^{\pm})$, where the D^0 or $\overline{D^0}$ decay to $K^+ \pi^- \pi^0$. We measure the ratios of the suppressed to favored branching fractions as well as the CP asymmetries of those modes. Since the amplitudes for the processes $B^{\pm} \rightarrow \overline{D^0} K^{\pm}$ and $B^{\pm} \rightarrow D^{\{0\}} K^{\pm}$ are proportional to V_{cb} and V_{ub} , respectively, these decays are sensitive to the weak phase γ as well as to the magnitude r_B of the ratio between the two amplitudes. Finally, we report on the results of a search for the decays $B^{\pm} \rightarrow D^{\{0\}} K^{(*)0}$.

Primary author: BABAR, Collaboration (SLAC)

Presenter: MARTINEZ-VIDAL, Fernando (Universidad de Valencia)

Session Classification: 06 - CP violation, CKM and Rare Decays

Track Classification: 06 - CP violation, CKM and Rare Decays