Measurement of B^0 Meson Properties

Via Partial Reconstruction of the Decay $\bar{B}^0 \to D^{*+}\ell^-\bar{\nu}$

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ABSTRACT

Using data recorded by the CLEO II detector operating at the $\Upsilon(4S)$ resonance at the Cornell Electron Storage Ring, several properties of B mesons are measured using a partially reconstructed tag of the decay mode $\bar{B}^0 \to D^{*+}\ell^-\bar{\nu}$. Using 2.38 fb^{-1} of on-resonance data and the averaged B meson semileptonic branching fraction through inclusive lepton momentum spectrum obtained by previous CLEO analysis, we measure the B^0 and B^- semileptonic branching fraction to be $(10.78\pm0.60\pm0.69)\%$ and $(10.25\pm0.57\pm0.65)\%$ respectively, which yields the lifetime ratio $\tau_+/\tau_0 = 0.950^{+0.117+0.091}_{-0.080-0.068}$, assuming the equality of semileptonic partial branching width for $\bar{B}^0$ and B^-. With a larger dataset of 3.1 fb^{-1}, we measured the $B^0 - \bar{B}^0$ mixing parameter χ_d to be $0.189 \pm 0.019 \pm 0.006$.

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