Abstract Submitted
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Precision measurement of the natural line width of the D^{*+} at BABAR ZACHARY HUARD, University of Cincinnati, BABAR COLLABORATION — We measure the total width of the $D^*(2010)^+$ in the transition $D^{*+} \to D^0\pi^+$, where the D^0 is reconstructed in the decay modes $D^0 \to K^-\pi^+$, $D^0 \to K^-\pi^+\pi^0$, $D^0 \to K^0_S\pi^-\pi^+$, and $D^0 \to K^-\pi^+\pi^-\pi^+$. Our data sample corresponds to an integrated luminosity of 487 fb^{-1}, more than 50 times greater than for the current best measurment of the D^{*+} width. The data were recorded at center-of-mass energies 10.58 and 10.54 GeV with the BABAR detector at the PEP II asymmetric energy e^+e^- collider. We use simulated events to model the resolution in Δm, the difference between the reconstructed invariant masses of the D^{*+} and D^0 candidates. We obtain the D^{*+} width by fitting the measured Δm distribution to a Breit-Wigner lineshape convolved with the resolution function.

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