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**Aspects of the  $\sin 2\beta$  measurement specific to the decay mode  $B^0 \rightarrow J/\psi K_L^0$**  EMILIE MARTIN, University of California at Irvine, BABAR COLLABORATION — We present the details of the  $\sin 2\beta$  measurement that are specific to the decay mode  $B^0 \rightarrow J/\psi K_L^0$ , using a sample of 384 million  $\Upsilon(4S) \rightarrow B\bar{B}$  events, collected by the BaBar detector at the PEP-II asymmetric-energy  $B$  Factory. We use several parameters for the  $\sin 2\beta$  fit that are unique to the  $B^0 \rightarrow J/\psi K_L^0$  decay. The relative fractions for signal and various inclusive  $J/\psi$  modes are input to the fit and are split by reconstruction type,  $J/\psi$  lepton decay type and tagging category. We also use the parameters of the PDFs to the  $\Delta E$  shapes for signal and different background distributions derived from fits to the Monte Carlo events and split by reconstruction type and  $J/\psi$  lepton decay type.

Soeren Prell  
Iowa State University

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