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Measurement of beam polarization at an e^+e^- B-Factory with a new tau polarimetry technique

Tuesday 5 December 2023 17:40 (20 minutes)

Belle II is considering upgrading SuperKEKB with a polarized electron beam. The introduction of beam polarization to the experiment would significantly expand the physics program of Belle II in the electroweak, dark , and lepton flavor universality sectors. For all of these future measurements a robust method of determining the average beam polarization is required to maximize the level of precision. The $BABAR$ experiment has developed a new beam polarimetry technique, Tau Polarimetry, which exploits the τ decay kinematics to measure the average beam polarization to better than half a percent. We present the results obtained by $BABAR$, including details of the studies of systematic uncertainties, using 420 fb^{-1} collected at the e^+e^- PEP-II collider, which demonstrates the feasibility of using Tau Polarimetry at future colliders such as an upgraded Belle II or the ILC.

Name of collaboration or list of co-authors

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