

Title: The E166 Experiment: Undulator Based Production of Polarized Positrons
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The E166 Experiment has been carried out in the Final Focus Test Beam at SLAC to demonstrate production of polarized positrons suitable for implementation at the ILC. A 1-m long helical undulator of 2.54 mm period produced circularly polarized photons (1st harmonic endpoint 7.9 MeV for a 46.6-GeV beam). The polarized photons were converted to polarized positrons in a thin target and analysed by transmission polarimetry of photons obtained on “reconversion” of the positrons. The measured polarization reached 80% for positrons near 6 MeV and 90% for electrons near 7 MeV. The measurements agree with simulations made with an upgraded Geant4 version including the dominant polarization-dependent electromagnetic interactions.