

Taking the established nonzero value of  $\theta_{13}$ , we study the possibility of extracting the Dirac CP-violating phase by a beta beam facility with a boost factor  $100 < \gamma < 450$ . We compare the performance of different setups with different baselines, boost factors and detector technologies. We find that an antineutrino beam from  $^6\text{He}$  decay with a baseline of  $L=1300$  km has a very promising CP discovery potential using a 500 kton Water Cherenkov (WC) detector. Fortunately this baseline corresponds to the distance between FermiLAB to Sanford underground research facility in South Dakota.