

Upgrading SuperKEKB with polarized e- beams

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Upgrading the SuperKEKB e+e- collider with a polarized e- beam is under consideration as it enables a new program of precision electroweak and other physics at 10.6 GeV, thereby opening exciting new windows in search of new physics. Measurements of left-right asymmetries (A_{LR}) of e+e- transitions to pairs of muons, c- and b-quarks would yield substantial improvements to the determinations of the neutral current vector coupling of those final states and hence $\sin^2 \theta_W$. A_{LR} measurements of final state e+e- and taus would determine $\sin^2 \theta_W$ with the Z-pole precision but at much lower energy. These will probe the running and universality of neutral current couplings with unprecedented precision. Other Tau and QCD physics is also enhanced. This paper will include a discussion of the physics as well as the necessary upgrades to SuperKEKB: polarized e- source, precision polarimetry, and spin rotators that all must be introduced while maintaining the high luminosity

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