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To study the emittance dilution in Superconducting Linear Accelerator Design for International Linear Collider (ILC) KIRTI RANJAN, University of Delhi and Fermilab, NIKOLAY SOLYAK, SHEKHAR MISHRA, Fermi National Accelerator Laboratory (Fermilab), PETER TENENBAUM, Stanford Linear Accelerator Centre (SLAC) — Recently the particle physics community has chosen a single technology for the new accelerator, opening the way for the world community to unite and concentrate resources on the design of an International Linear collider (ILC) using superconducting technology. One of the key operational issues in the design of the ILC will be the preservation of the small beam emittances during passage through the main linear accelerator (linac). Sources of emittance dilution include incoherent misalignments of the quadrupole magnets and rf-structure misalignments. In this work, the study of emittance dilution for the 500-GeV center of mass energy main linac of the Superconducting Linear Accelerator design, based on adaptation of the TESLA TDR design is performed using LIAR simulation program. Based on the tolerances of the present design, effect of two important Beam-Based steering algorithms, Flat Steering and Dispersion Free Steering, are compared with respect to the emittance dilution in the main linac. We also investigated the effect of various misalignments on the emittance dilution for these two steering algorithms.

Kirti Ranjan
University of Delhi and Fermilab

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