Contribution ID: **116** Type: **(a) Talk abstract only**

FCC-ee Injector: New DR at 2.86 GeV

Wednesday 21 May 2025 10:30 (20 minutes)

The new optimised FCC-ee injector layout imposed a review of the intrinsic structure of damping ring (DR) Transfer Lines (TLs). The presence of two independent linacs for electron and positron beams, and the elimination of the common linac, naturally led to increased DR energy which, to avoid spin resonances, was set at the value of 2.86 GeV.

The main concept driving the DR and TLs design consists of achieving an overall efficiency of the order of 80% in transporting electron and positron beams from the respective LINACs, through the DR for emittance cooling, to the end of the TLs conveying extracted beams toward the collider booster. Electron and positron LINACs produce beam pulses at 100 Hz, each pulse consists of 4 bunches spaced by 25 nsec, each bunch stores a variable charge intensity up to 5 nC. The DR is mainly needed to reduce the emittance of the incoming positron beam by more than three orders of magnitude, from 2.4×10^{−6} m·rad to about 1.8×10^{−9} m·rad

The new DR lattice features a six-fold symmetry. It consists of six arc cells connected by six straight sessions. Each straight session is used to host three wiggler magnet insertions, one RF cavity module, and two independent injection/extraction sections. Injection and extraction will be implemented in the same branch for the two-particle species in order to avoid changing the polarities of the DR magnets, thus ensuring fast and reliable operation modes for both electron and positron. The injection will be performed using an on-axis scheme.

Authors: DE SANTIS, Antonio; MILARDI, Catia (INFN e Laboratori Nazionali di Frascati (IT)); ETISKEN, Ozgur (Ankara University (TR))

Presenter: DE SANTIS, Antonio

Session Classification: FCC-ee injector

Track Classification: FCC accelerators: FCC-ee injector