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Synchrotron Radiation studies for the FCC-ee arc with FLUKA

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The FCC-ee arc region is significantly impacted by the synchrotron radiation (SR) emitted by the electron and positron beams. In order to assess its actual effect on the magnets and tunnel environment, FLUKA simulations were performed for the most challenging case of top-pole operation at 182.5GeV. In this presentation, the advantages and disadvantages of two different solutions are discussed. One layout features localized photon absorbers, while the other one embeds a continuous shielding around the vacuum chamber, comparable to the LEP model.

For evaluating critical situations and identifying potential showstoppers, the power deposited on the various machine components as well as dose and particle fluence 3D maps are presented, including radiation levels relevant to electronics. Finally, an outlook of pending challenges and next steps is given.

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