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Strategy for mitigating radiation to equipment in FCC-ee

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The radiation fields generated by synchrotron photons and beam losses pose a significant challenge for FCCee equipment. The annual ionizing dose can reach MGy-levels in the collider tunnel and requires dedicated shielding configurations in order to reduce the need of expensive radiation-hard equipment. A first shielding concept for the collider arc dipoles has been conceived in the Feasibility Study phase, demonstrating that a substantial reduction of the radiation levels is achievable. In addition, the option of housing accelerator electronics in a dedicated bunker near lattice quadrupoles has been explored, which can possibly allow for custom-off-the-shelf-based radiation tolerant electronics systems. This presentation summarizes the next steps and the goals for the pre-TDR phase. Key objectives are to review and consolidate the target radiation levels for the tunnel and the electronics bunker, to derive radiation level specifications for equipment and infrastructure, and to progress on the mechanical design and integration of the dipole shielding and the bunker. The presentation highlights the present study directions, including a simplification of the dipole shielding topology and a larger photon stopper volume. Furthermore, the space requirements for the electronic racks and the integration options for the bunker are discussed. While most of the shielding studies in the Feasiblity Study phase focussed on the arcs, the presentation also outlines the study plans for the technical and experimental insertions.

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