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The Availability Challenge: Opportunities within the FCC-ee Operation Cycle

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To reach integrated luminosity goals, the FCC-ee must be operational for minimum 80% of the scheduled 185 physics days each year. For comparison, the LHC achieved 77% in Run 2, 2016-2018. There are additional challenges in operation and maintenance of the FCC-ee due to its scale, complexity and ambitious technical objectives. Availability is therefore a significant risk to physics deliverables, and merits consideration especially in the early stage of the design process. This presentation outlines recent key findings from the FCC-ee availability study following new information from the Mid Term report and input from technical infrastructures. Contributions are as follows: (I) The baseline FCC-ee Operation Cycle is presented, including key constraints imposed by the need for energy calibration by resonant depolarisation. (II) For the first time, the relationship between availability and integrated luminosity imposed by this operation cycle is formalised and quantified in Monte Carlo simulation. (III) Updates to the RF availability model are illustrated, including estimation of the minimum redundancy required to reach luminosity targets. (IV) Compelling solutions to overcome shortcomings in the baseline FCC-ee operation cycle are discussed, and powerful opportunities for R&D are highlighted.

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