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## **Studies on a triple-turn energy-recovery mode at the S-DALINAC**

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The electron accelerator S-DALINAC at TU Darmstadt was successfully operated in single and double-turn energy-recovery mode. The latter was realized using a shared beam-transport where two beams are superimposed in the first recirculation beamline. Due to its current design, the S-DALINAC can be upgraded with reasonable effort to be operated in triple-turn energy-recovery mode with shared beam-transport. Here, two beams are superimposed in both, the first and the second recirculation beamline. This mode is particularly challenging due to a reduced number of degrees of freedom compared to an individual beam-transport. Therefore, the triple-turn energy-recovery mode requires precise determination of the accelerator setup obtained from beam-dynamics simulations prior to beam-tuning. The results of the necessary beam-dynamics simulations for this mode are presented.

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### **Footnotes**

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