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## Wire scanner based beam diagnostics during energy-recovery operation at the S-DALINAC

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The electron accelerator S-DALINAC can be operated in conventional acceleration (CA) and energy recovery (ER) modes. In an ER mode, electrons pass the main linear accelerator (LINAC) twice as often compared to the corresponding CA mode: following the acceleration, the electrons are decelerated to return kinetic energy to the electromagnetic fields inside the cavities of the main LINAC. The recovered energy is recycled during the acceleration of subsequent electrons. However, as a result of the deceleration, the electromagnetic fields are impacted. Thus, the fields and consequently the beam properties after acceleration in ER mode differ from those in CA mode. To compare the beam properties after acceleration present in both modes, a non-destructive diagnostic system is necessary since otherwise the ER mode would be interrupted. For this reason, wire scanners were built and used to measure beam properties in the two-turn CA and the two-turn ER mode. Details on the wire scanners and the measurements are presented.

### Footnotes

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