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Reaching design electron energy at FLASH after linac upgrade

Tuesday 27 August 2024 16:00 (2 hours)

The FLASH 2020+ project at DESY includes, among other modernizations, an upgrade of the electron beam energy. Two accelerator modules were replaced and the RF distribution of the other modules was optimized. The limiting factors such as cavity quenching and field emissions are identified and measured at acceleration modules. At a later stage, based on those measurements, a high-power distribution adjustment scheme was proposed and the optimal operating point was demonstrated to achieve the design energy of 1.35 GeV with the nominal RF pulse length at FEL lasing conditions. After proper optimization and tuning of the low-level RF parameters, the linac successfully operated at maximum energy and delivered SASE-FEL radiation in the wavelength range below 3.2 nm. The measurement results as well as the achieved cavity gradients with energy gains are presented.

Footnotes

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