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First Beam Heating Studies with the Laser Heater for FLASH2020+

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Within the framework of FLASH2020+, substantial parts of the injector of the FEL user facility FLASH have been upgraded during a nine-month shutdown in 2022 to improve the electron bunch properties in preparation for FEL operation with external seeding starting in 2025. As part of the injector upgrade, a laser heater has been installed upstream of the first bunch compression chicane to control the microbunching instability in the linear accelerator by a defined increase of the uncorrelated energy spread in the electron bunches. In this paper, we present first results of beam heating studies at FLASH. Measurements of the induced energy spread are compared to results obtained by particle tracking simulations.

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