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FERMI FEL-1 Upgrade to EEHG

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In order to meet the user request of extending the FERMI FEL spectral range over the whole water window, we are developing an upgrade strategy that is based on the implementation of the Echo Enabled Harmonic Generation (EEHG) scheme.

The FERMI upgrade strategy is structured as follow: during a first phase, the single cascade FEL-1 branch will be adapted to operate either in EEHG or in HGHG. This upgrade can be achieved with relatively low cost and impact on FERMI operations and will improve the spectral range, spectral quality and scheme flexibility of FEL-1. Furthermore, it will provide a versatile test bench opening the possibility to explore in details the EEHG scheme potentialities and address many of the possible issues related to the second and more critical phase of the upgrade project: the upgrade of FEL-2. These two phases will proceed in parallel to the LINAC upgrade to increase the nominal energy. Solutions aiming at a peak beam energy of 1.8 and 2.0 GeV are under study.

In this contribution we will focus on the upgrade of the FEL-1 branch that has already started and is foreseen to provide light to users with the new configuration by spring 2023.

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Yes

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