**FEL2022** 



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## Two Color Upgrade of the IR FEL at FHI Berlin

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Since coming on-line in November 2013, the Fritz-Haber-Institut (FHI) der Max-Planck-Gesellschaft (MPG) Free-Electron Laser (FEL) has provided intense, tunable infrared radiation to FHI user groups. It has enabled experiments in diverse fields ranging from bio-molecular spectroscopy to studies of clusters and nanoparticles, nonlinear solid-state spectroscopy, and surface science, resulting in 85 peer-reviewed publications so far. A significant upgrade of the FHI FEL is now nearing completion. A second short Rayleigh range undulator FEL beamline has been added that will permit lasing from < 5 microns to > 160 microns in the far IR. Additionally, a 500 MHz kicker cavity has been installed. It will permit simultaneous two-color operation of the FEL from both FEL beamlines over an optical range of 5 to 50 microns by deflecting alternate 1 GHz pulses into each of the two undulators. We will describe the upgraded FHI FEL physics and engineering design and present the current status of commissioning.

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Yes

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