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Fabrication and commissioning of the 1st high gradient (HG) module for the FERMI LINAC upgrade

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FERMI is the seeded Free Electron Laser (FEL) user facility at Elettra laboratory in Trieste, operating in the VUV to soft X-rays spectral range. In order to extend the FEL spectral range to shorter wavelengths, an upgrade plan for increasing the Linac energy from 1.5 GeV to 2.0 GeV is actually going on. After the successful testing of the short prototype of the new high gradient (HG) S-band accelerating structure up to an accelerating gradient of 40 MV/m, two full-length 3.0 m HG structures have been built and installed at the FERMI linac. In this paper, we report the low power measurement, conditioning results, and commissioning with the beam of the first HG module.

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