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Conditioning and High Power Test Results of First 3.0 m High Gradient Structure for FERMI Linac Energy Upgrade

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ERMI 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 successful testing of the short prototype of new high gradient S-band accelerating structure up to an accelerating gradient of 40 MV/m, a full length 3.0 m HG structure has been built in collaboration with Paul Scherrer Institute (PSI). In the first step, two such new structures would be installed in place of S0a and one deflector at K15 increasing the beam energy to 1.7 GeV. In the next phase 14 new HG structures would replace the present Backward Travelling Wave sections reaching to the final goal of 2.0 GeV. Currently first 3.0 m HG structure is under conditioning and high power testing at Cavity Test Facility of Elettra. In this paper we report the low power measurement results as well as conditioning results of 3.0 m HG structure.

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