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Author: J.Meißner, A.Oppelt, DESY

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DESIGN OF A NEW L-BAND GUN CAVITY

- EUROFEL deliverable 1.8 -

J.Meißner, A.Oppelt
DESY, Platanenallee 6, 15738 Zeuthen

In the framework of EUROFEL, a new L-band gun cavity for long RF pulses (650-800 μ s) and low repetition rates (10-50 Hz) has been developed by DESY. The gun design is based on the geometry of the existing guns [1]. In order to reach accelerating gradients as high as 60 MV/m and above, the gun cooling has been revised. Based on high power tests of available gun cavities at PITZ up to 27 KW average power [2] and followed by simulations [3], the cooling of the cavity end plates as well as the iris region has been improved in order to withstand an average heat load of 100 kW instead of 50 kW.

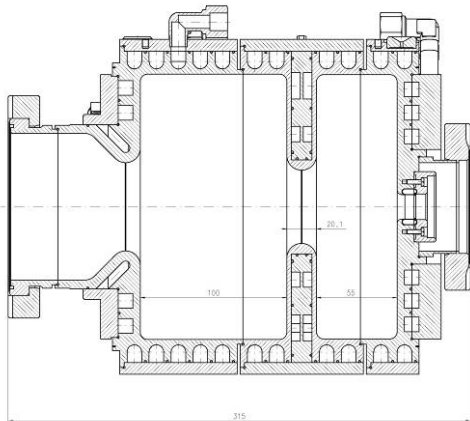


Fig.1: Section through the cavity and the cooling channels.

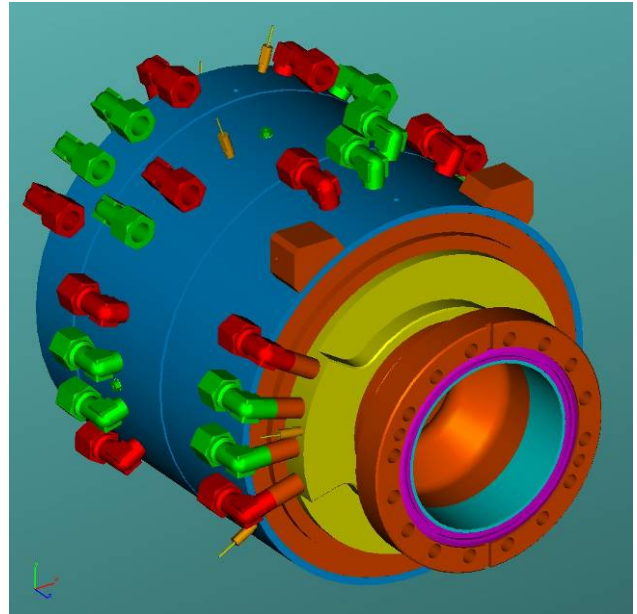


Fig.2: Outside view of the new gun cavity.

REFERENCES

- [1] K.Flöttmann, et al., RF gun design for the TESLA VUV Free Electron Laser, NIM A 393(1997) 93.
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- [3] F.Marhauser, Finite Element Analyses for RF Photoinjector Gun Cavities, TESLA-FEL report 2006-02.