Present status of the Rossendorf superconducting RF gun

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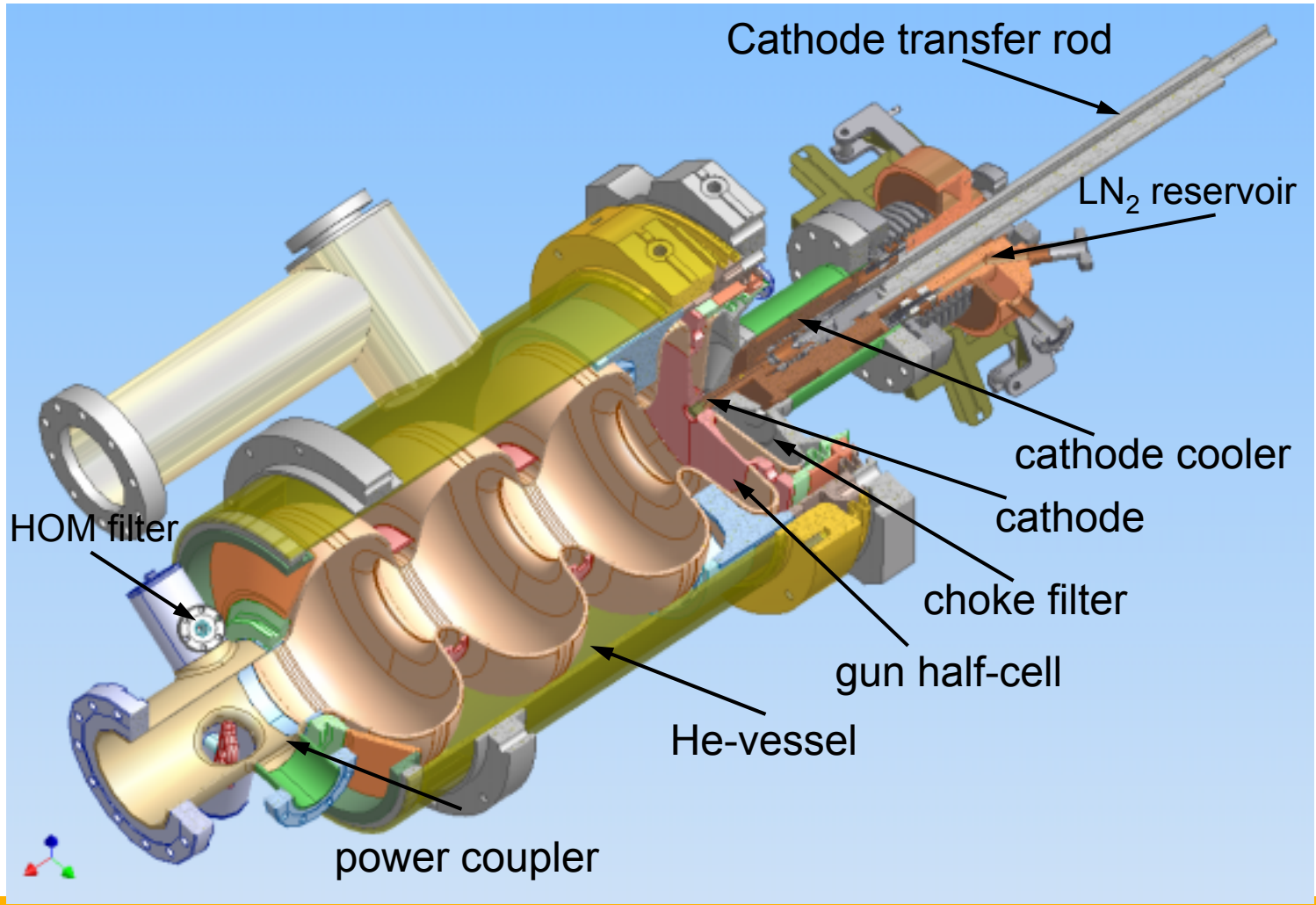
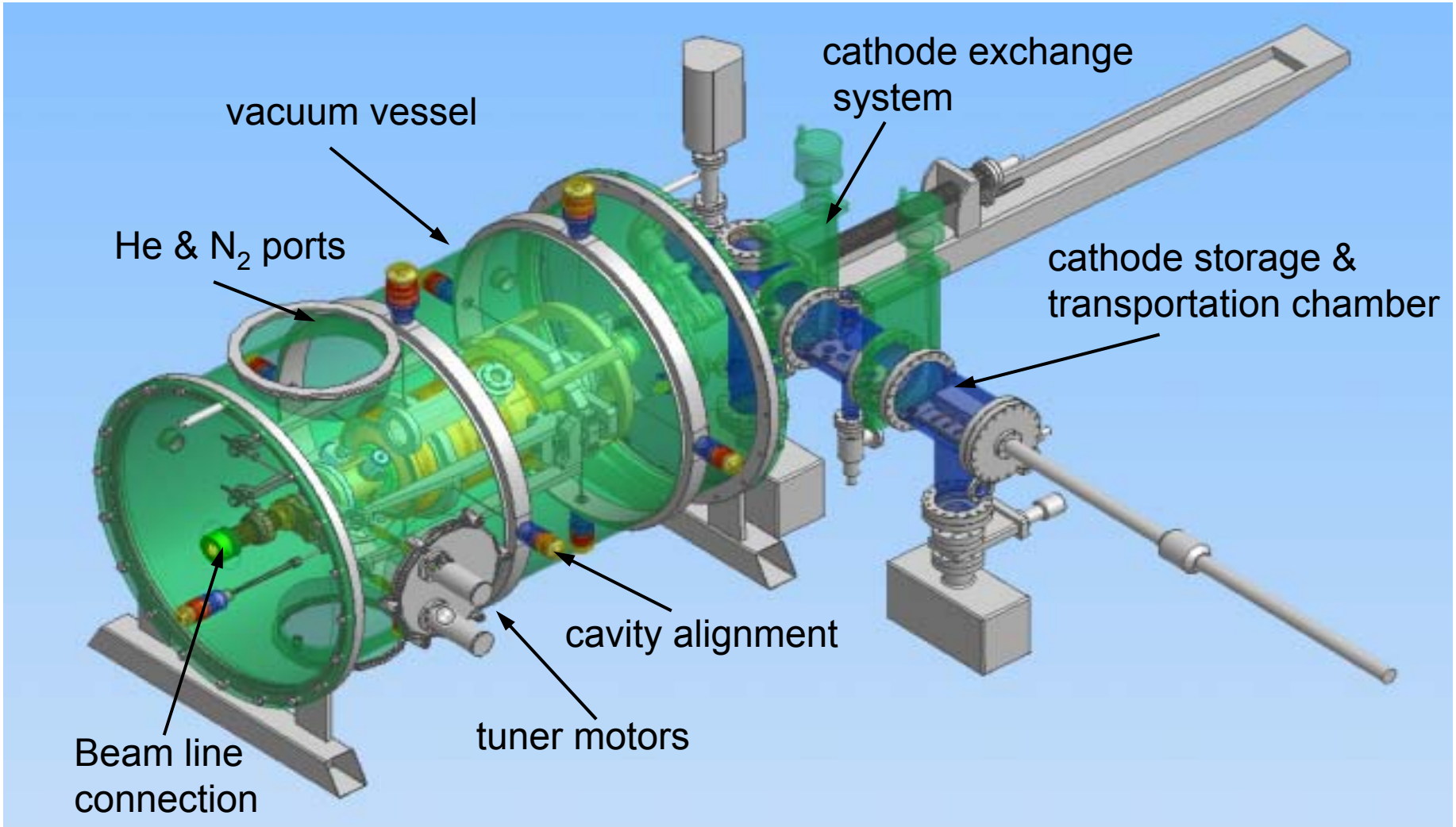
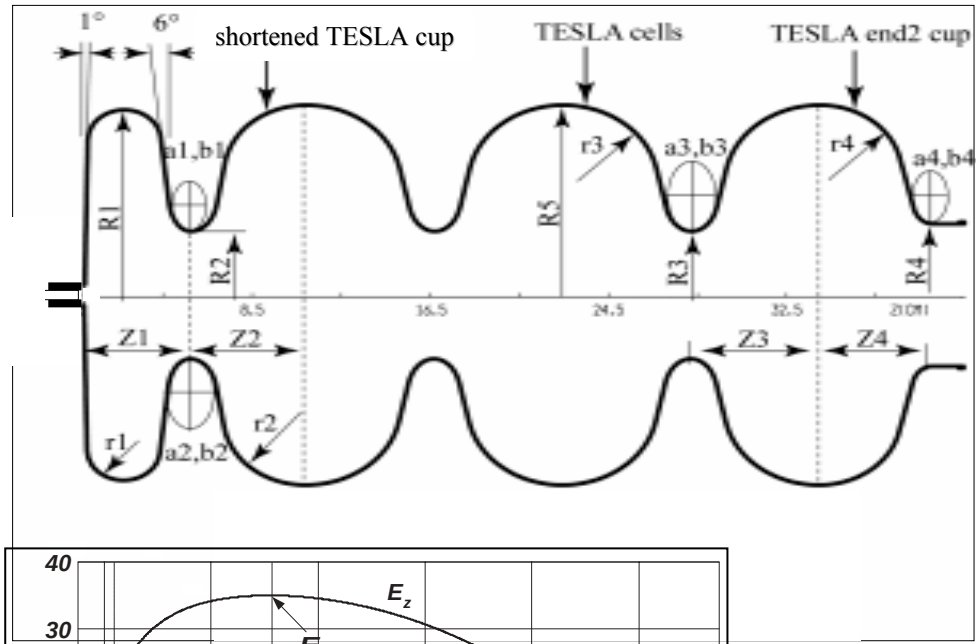
ELBE SRF Gun – Cavity design

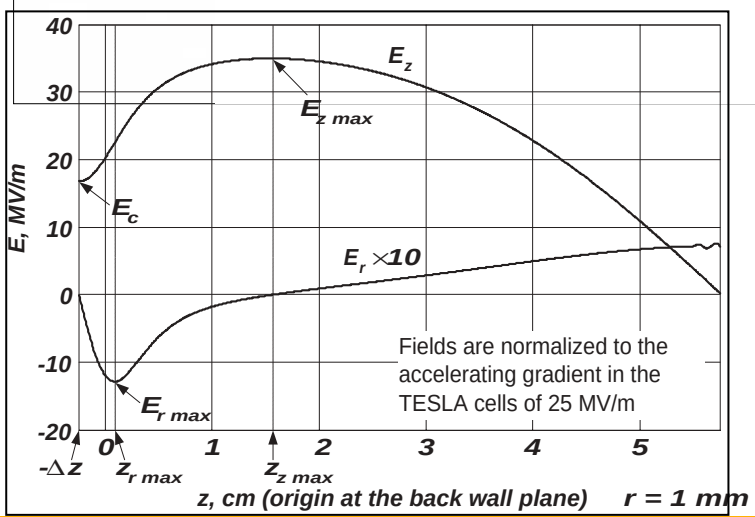


ELBE SRF Gun – Cryomodule design



ELBE SRF Gun – Design parameter



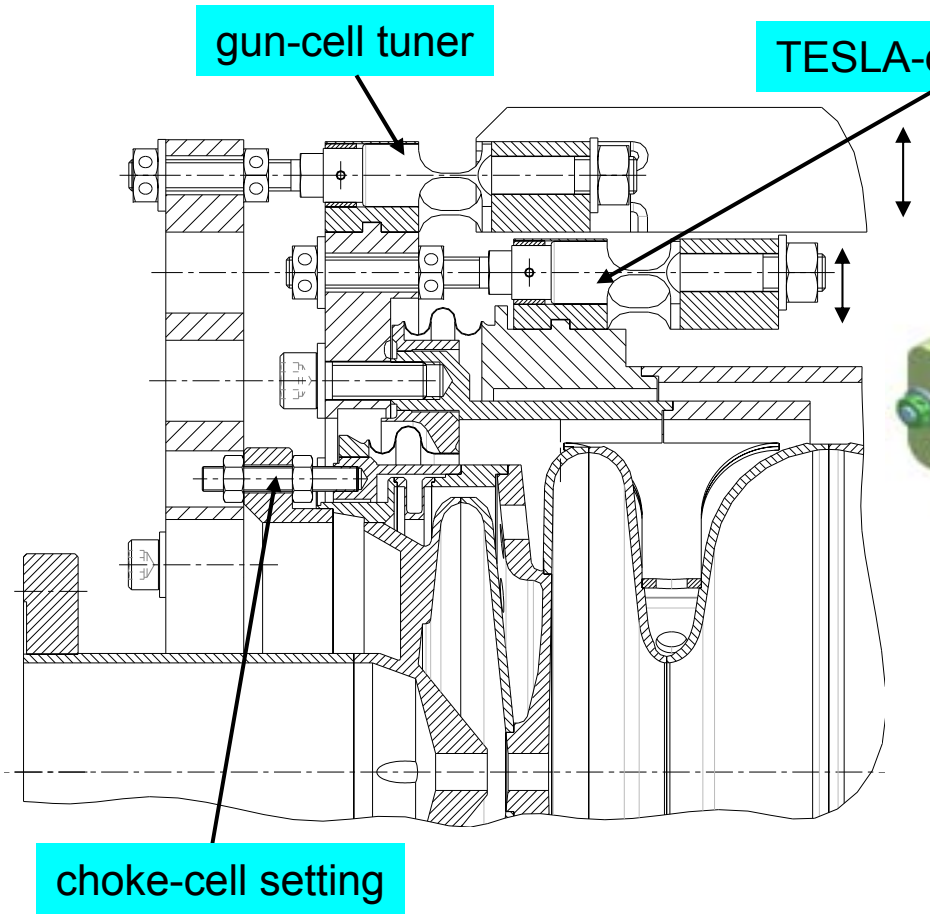


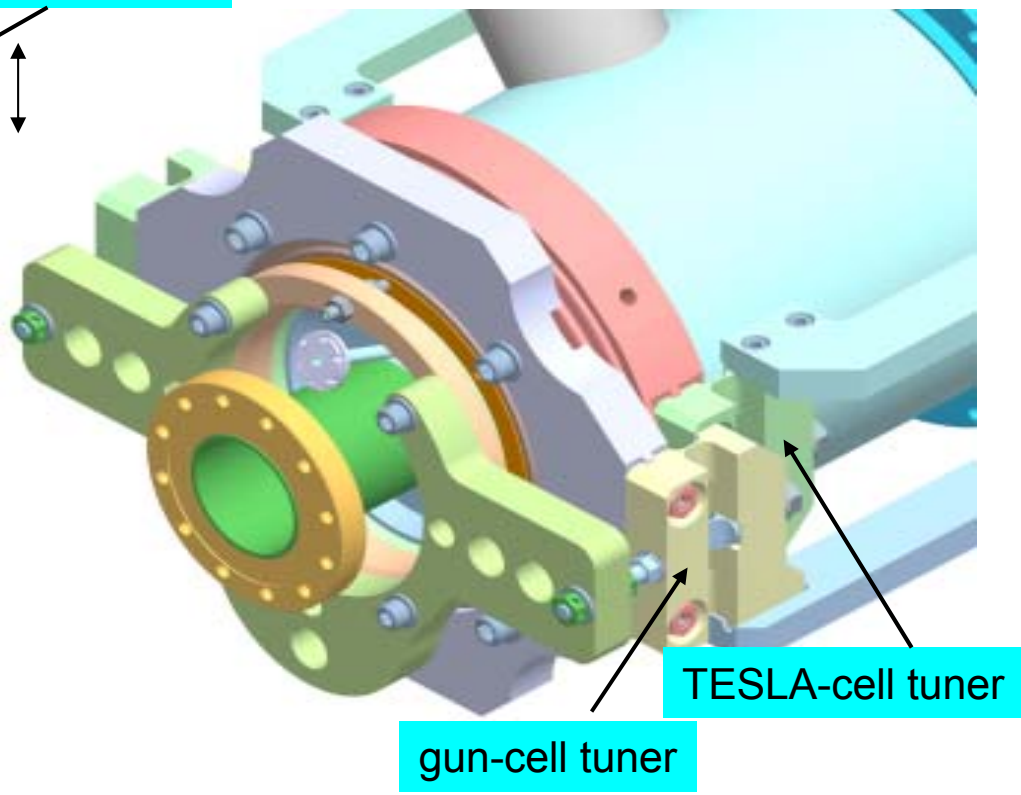
1. 3 GHz, 10 kW optimized half cell & 3 TESLA cells $E_{z,max}$ = 50 MV/m (T cells) = 33 MV/m (1/2 cell)	
Q = 77 pC	Q = 1 nC
I_{av} = 1 mA	
E = 9.5 MeV	
ε = 0.5 mm mrad	ε = 2.5 mm mrad

RF focusing in SC gun cavities

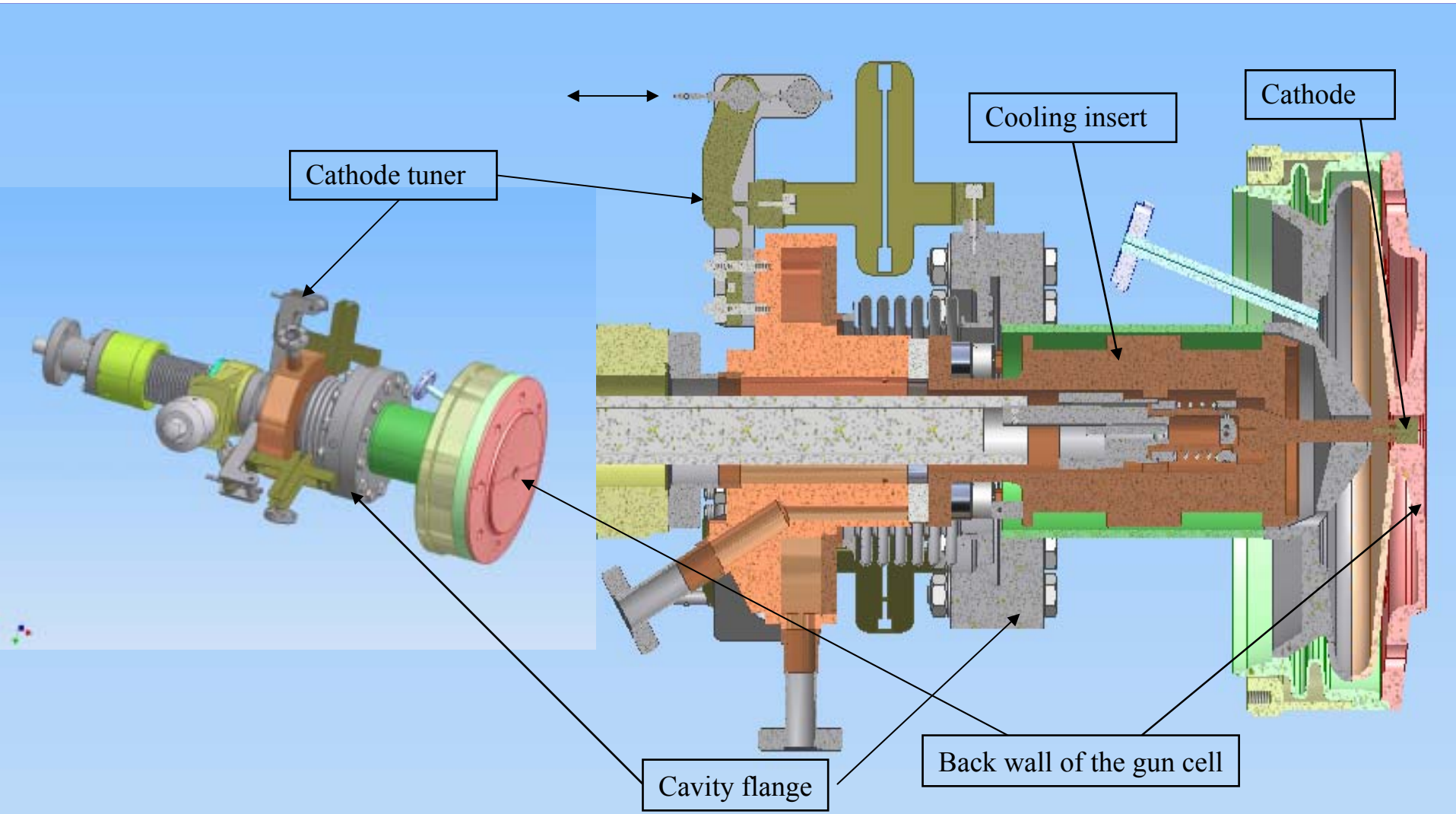
D. Janssen, V.Volkov, NIM A452(2000)34

ELBE SRF Gun-Tuning of the cavity

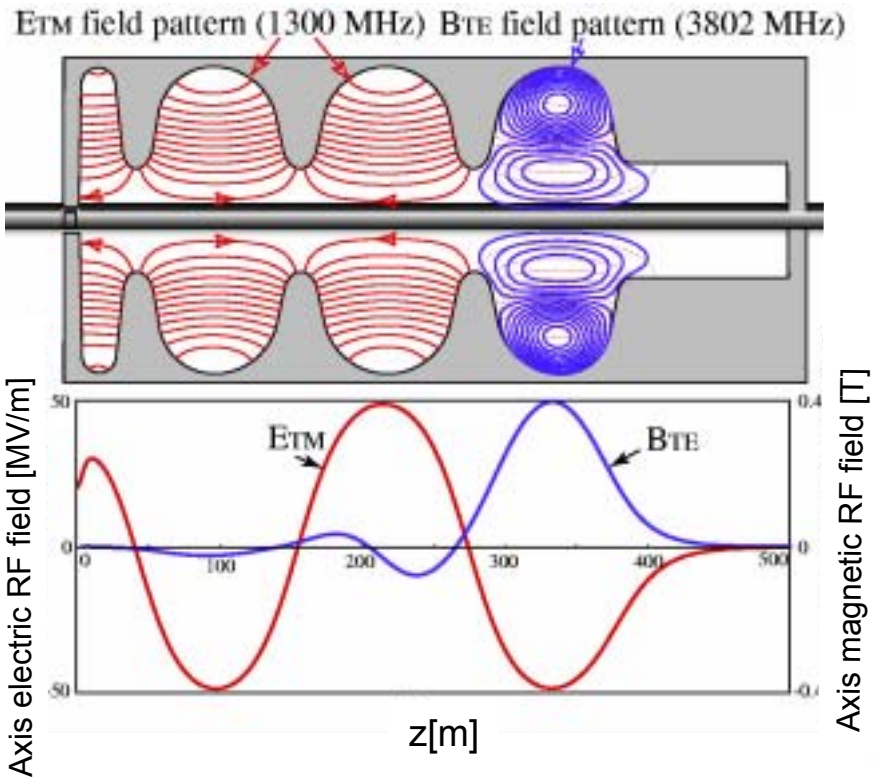


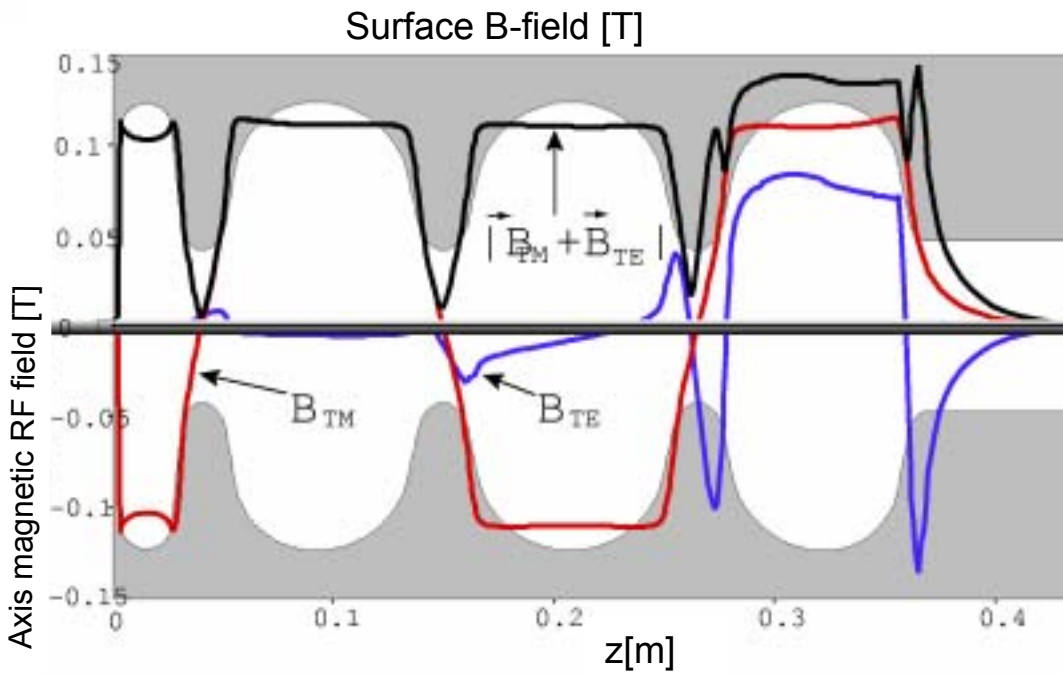


ELBE SRF Gun – Cathode tuner

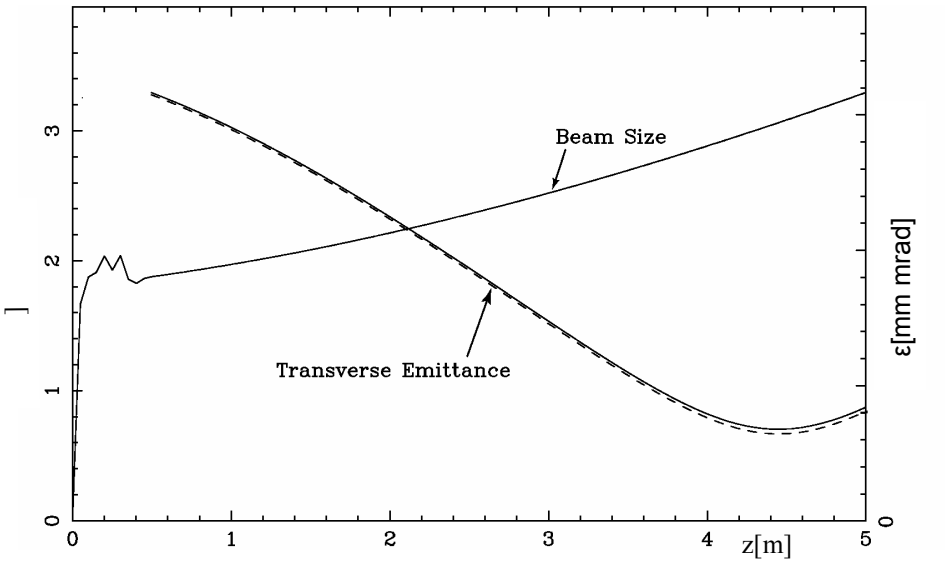


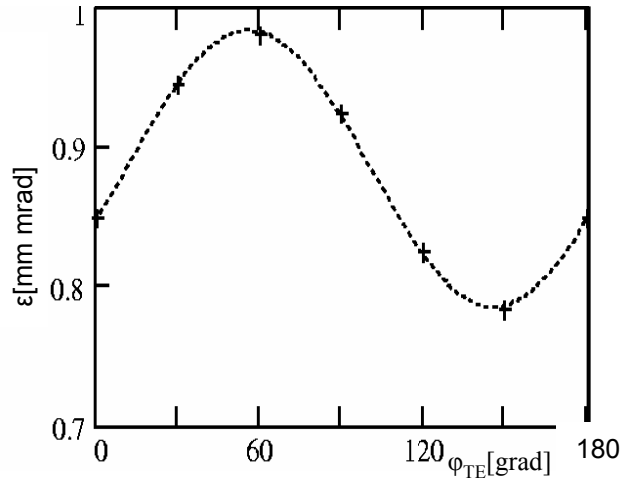
ELBE SRF Gun-Magnetic RF field inside the cavity





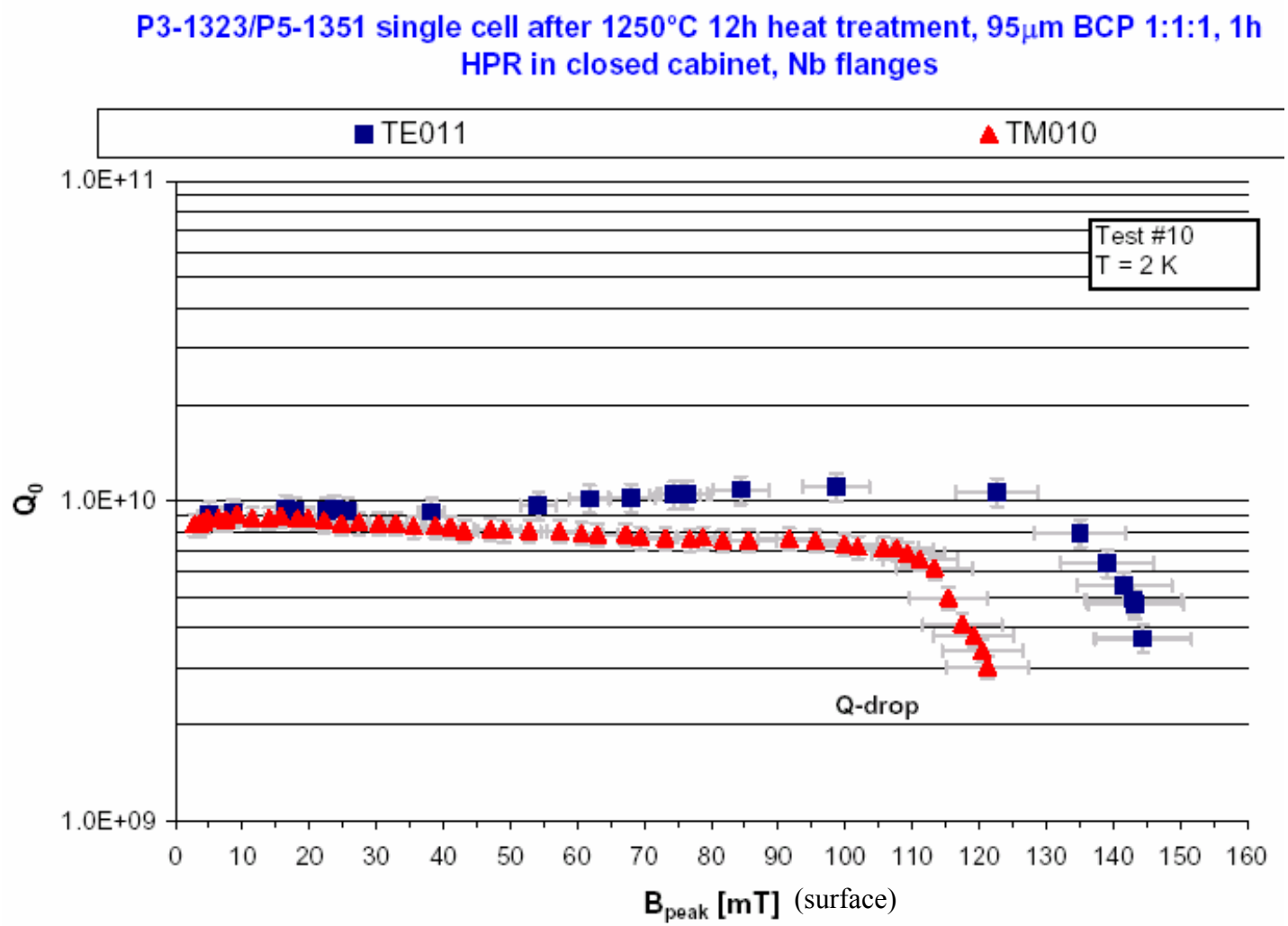
ELBE SRF Gun – Designparameter including the magnetic mode





Beam parameter		Field parameter		Laser parameter	
ε_x[mm mrad]	0.78 – 0.98	B_{TMsurf}[mT]	115	Puls length [ps]	20
σ_x[mm]	3.06	B_{TEsurf}[mT]	136	Raise time [ps]	1
ε_z[keV mm]	72.4		144	Spot size [mm]	2.6
Δz[mm]	2.79	$E_{TM,axis}$[MV/m]	50	Bunch charge[nC]	1
E_{av}[MeV]	8.82	φ_{TM}[grad]	74.6		
ΔE_{rms}[keV]	53.9	φ_{TE}[grad]	0 - 180		

ELBE SRF Gun – First measurements of the TE-mode



G. Ciovati, P.Kneisel private communication

ELBE SRF Gun – Present Status

Cavity:

Design finished, Fabrication of 2 (RRR 40 & 300) cavities at ACCEL GmbH

Cavity tuners:

Fabrication finished, tests necessary

Cathode cooling system :

Fabrication finished, tests necessary

Cathode transfer system:

Design finished

Cathode preparation chamber:

Design finished, in the work-shop

Cryomodule:

Design finished