

STATUS AND OPERATING EXPERIENCE OF THE TTF COUPLER

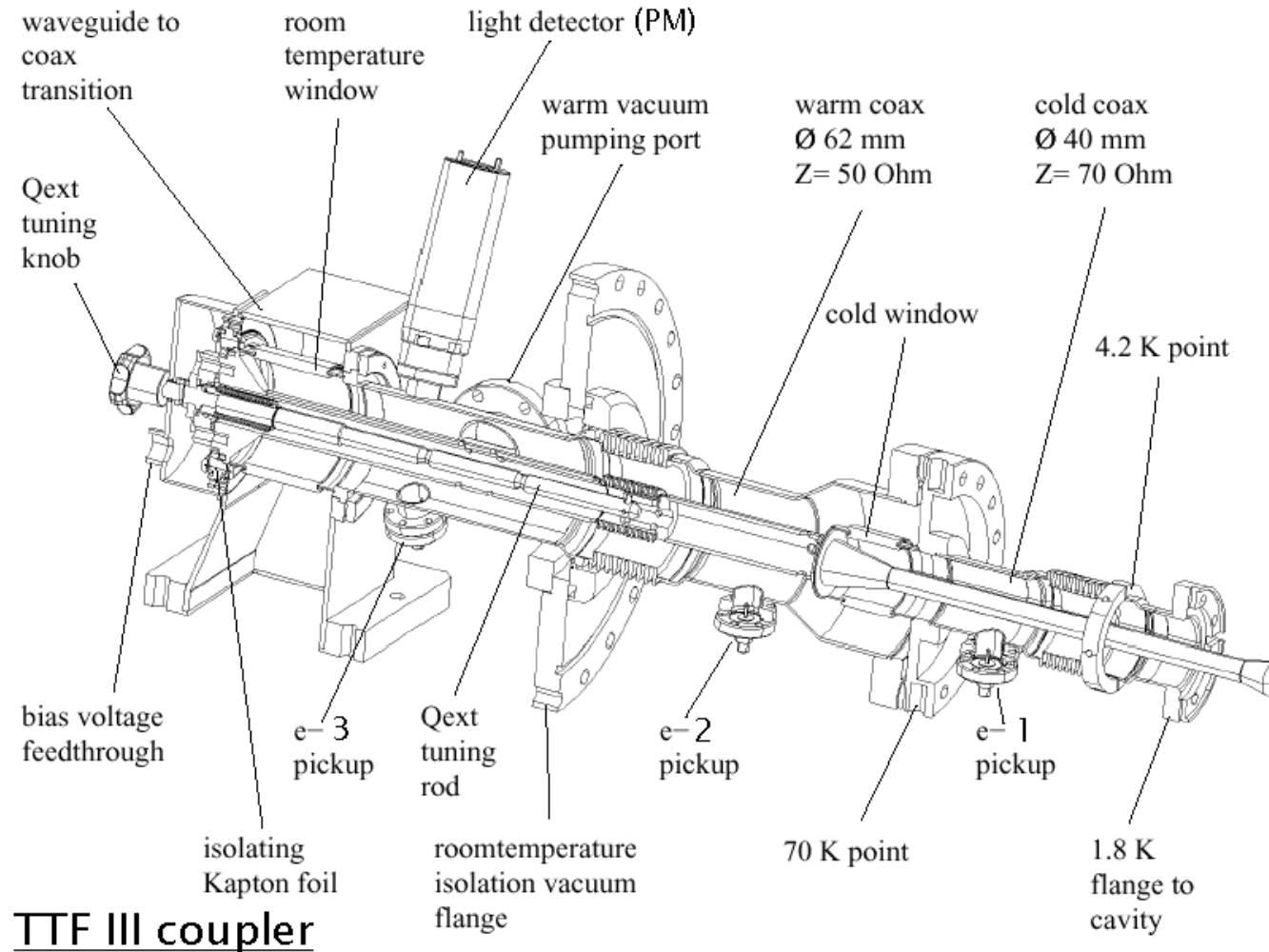
Poster MOP49

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RF high power couplers in the VUV-FEL

Coupler type	FNAL	TTF 2	TTF 3
cold window	conical	cylindrical	cylindrical
warm window	flat wave guide	flat wave guide	cylindrical
bias	no	yes	yes
fabricated totally	16	20	62
tested	16	20	24
used in TTF modules	12	19	11
assembled in modules	ACC 1, 2	ACC 2, 3, 4	ACC 1, 5
operated	1997-2004	1998-2004	2001-2004

The latest TTF Coupler Design



Processing times of TTF Couplers

- Coupler test stand: 70 - 125 h
two at a time, baked in situ
- Horizontal Cryostat: 20 - 120 h
one at a time, baked in situ
- Module: 900 - 1200 h
8 - 16 at a time, not backed
dominated by the older coupler design

High Gradient Test

- An electro polished cavity & TTF3 coupler have been operated at 35 MV/m for more than 1100 hours
- Forward power was above 600 kW
(due to the not compensated Lorentz Force detuning)
- No degradation in the performance of cavity or coupler
(During setup of LLRF system breakdowns in coupler and quenches in cavity were caused)

Conclusion

- All couplers in the VUV-FEL could be processed and operated on the needed power level
- Parallel processing and no backing increases the conditioning time
- Handling and storage has to be improved
- TTF3 couplers are successfully tested together with cavities up to 35 MV/m (600kW)
- Next steps: industrial studies for mass production and price reduction