



UPPSALA  
UNIVERSITET

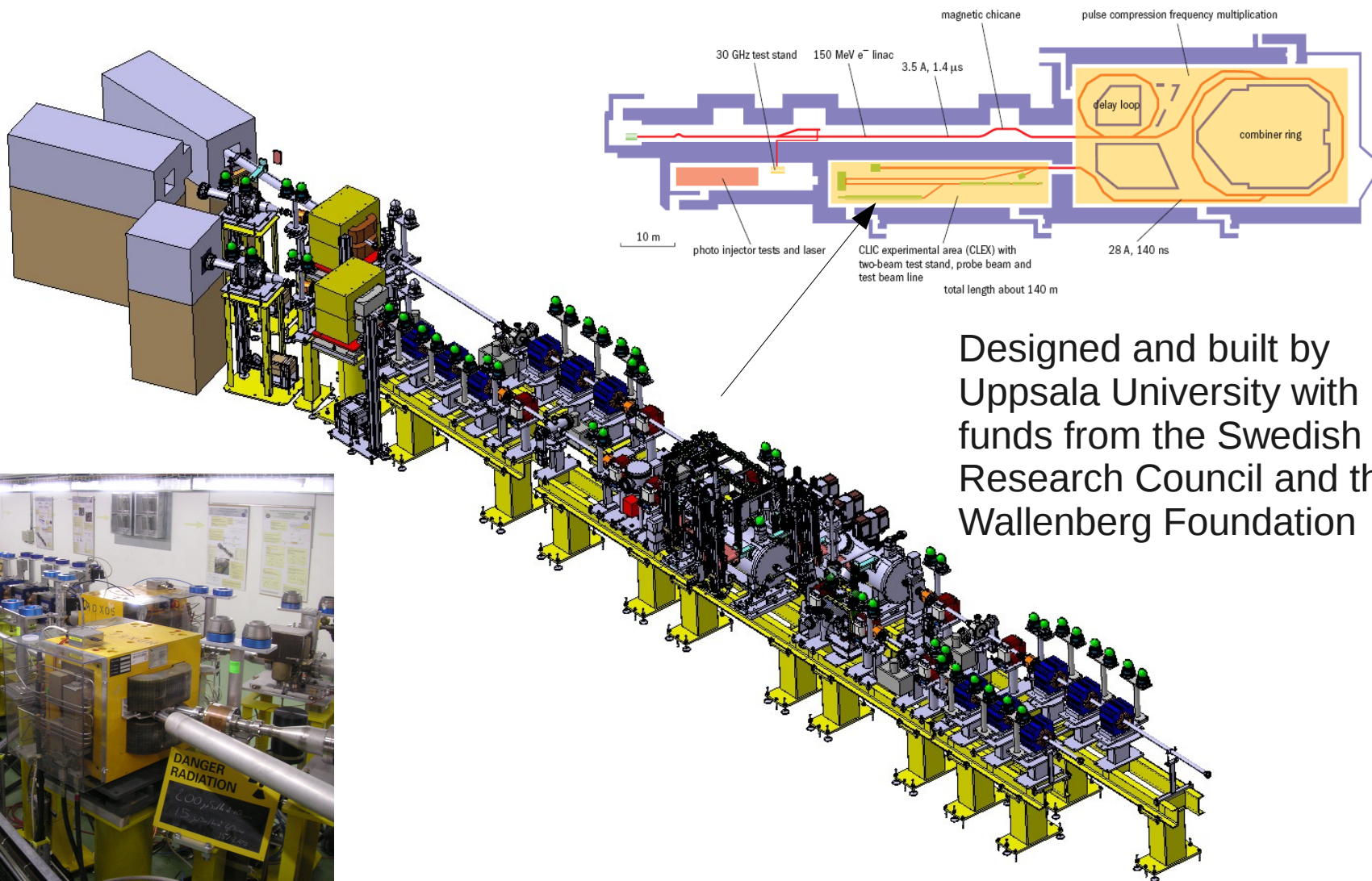
**NORDUCLIC**

# CLIC related Activities and Plans at Uppsala University

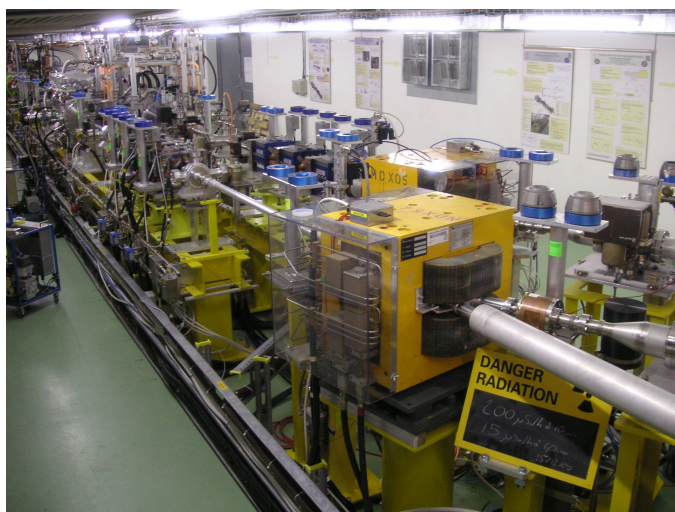
V. Ziemann, R. Ruber, T. Ekelöf,  
T. Muranaka, A. Palaia, M. Jacewicz

Department of Physics and Astronomy  
Uppsala University

# Two-Beam Test Stand

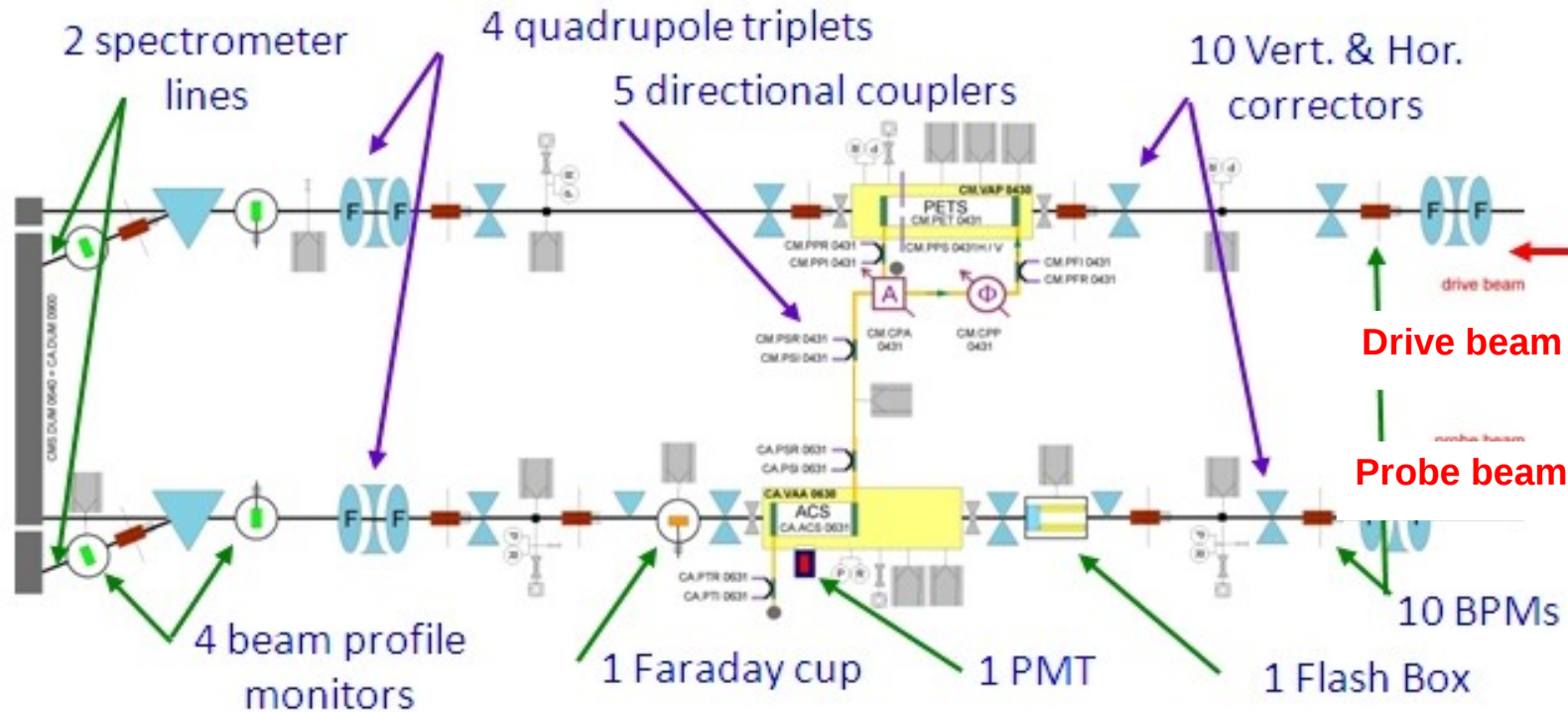
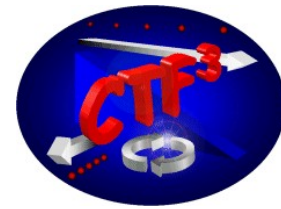


Designed and built by Uppsala University with funds from the Swedish Research Council and the Wallenberg Foundation





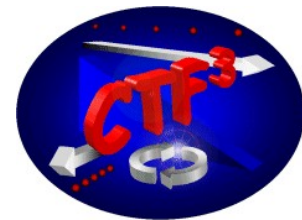
# Two-beam test stand



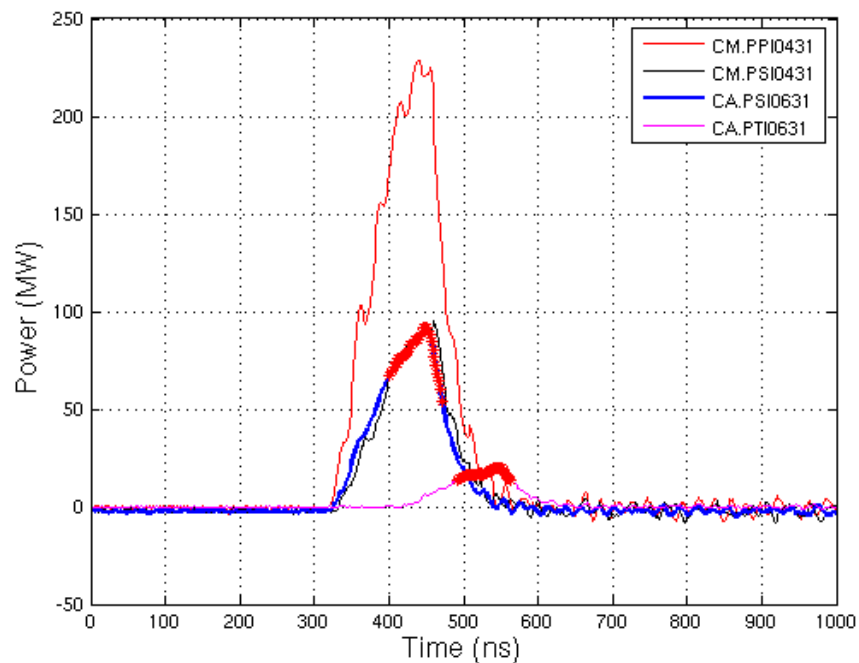
- Generate power in PETS in the drive beam
- Accelerate probe beam
- Diagnose what happens (acceleration, kicks, discharges, ejected ions)



# Power production in PETS



- Get 200 MW in recirculation mode inside PETS
- and 100 MW in acceleration structure



## X-band rf power production and deceleration in the two-beam test stand of the Compact Linear Collider test facility

E. Adli\*

*Department of Physics, University of Oslo, 0316 Oslo, Norway*

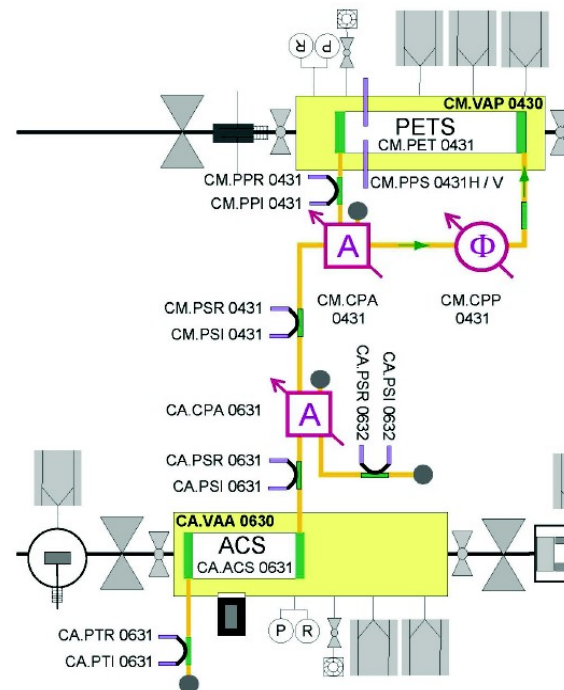
R. Ruber and V. Ziemann

*Department of Physics and Astronomy, Uppsala University, 75121 Uppsala, Sweden*

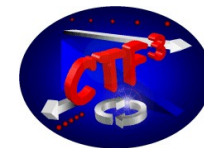
R. Corsini, A. Dubrovskiy, and I. Syratchev

*CERN, CH 1211 Geneva 23, Switzerland*

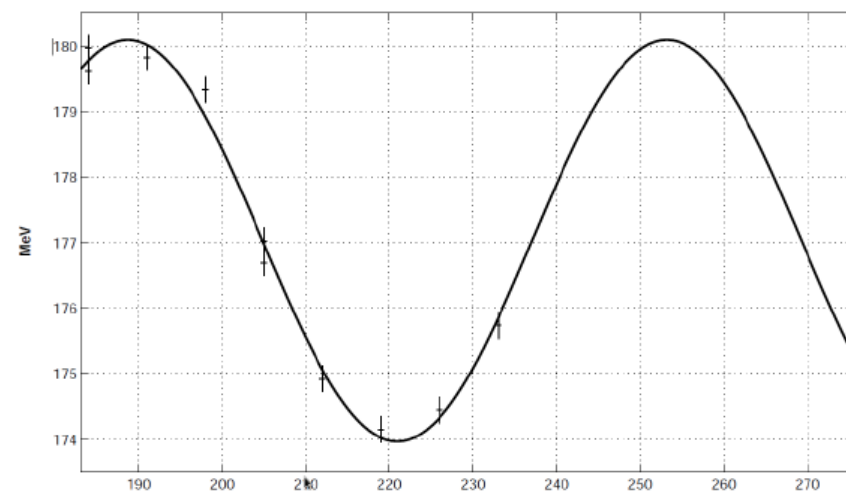
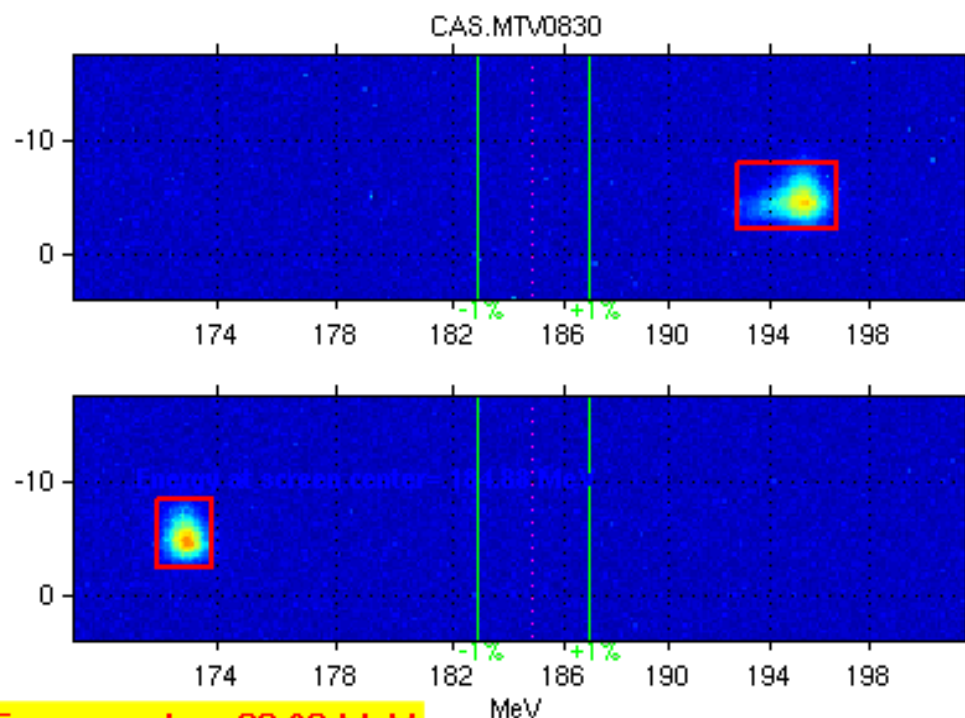
(Received 26 May 2011; published 22 August 2011)



# Accelerating the Probe Beam



- Observe beam spot on screen in spectrometer line
- Turn drive beam on and off
- Vary the RF phase of Califes

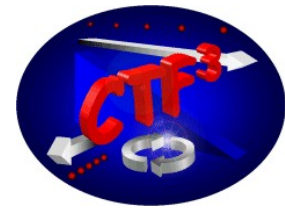


From A. Palaia, ILWC2010,  
data from 19.August 2010

From R. Corsini, 6th CLIC ACE

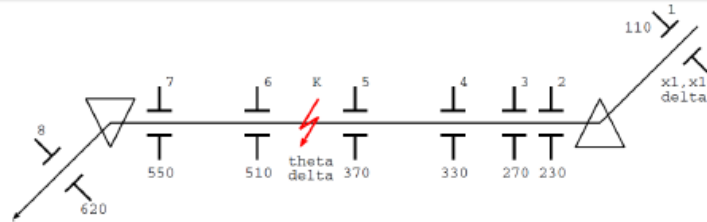


# Beam Kicks and Flashbox

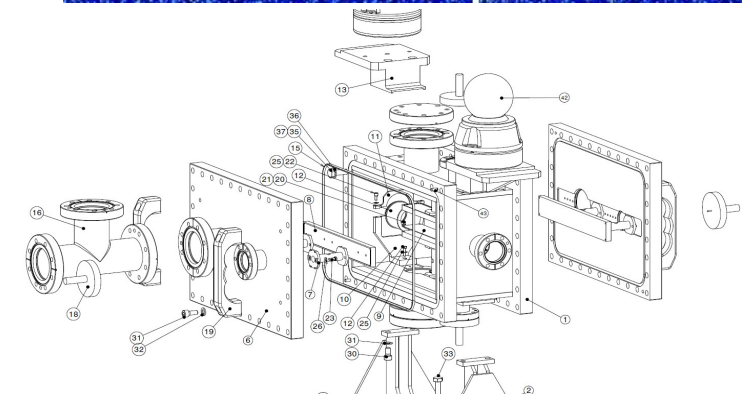
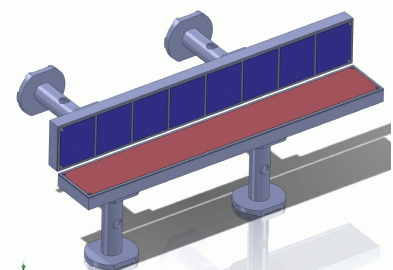
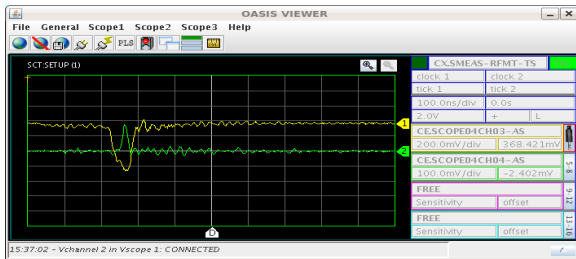
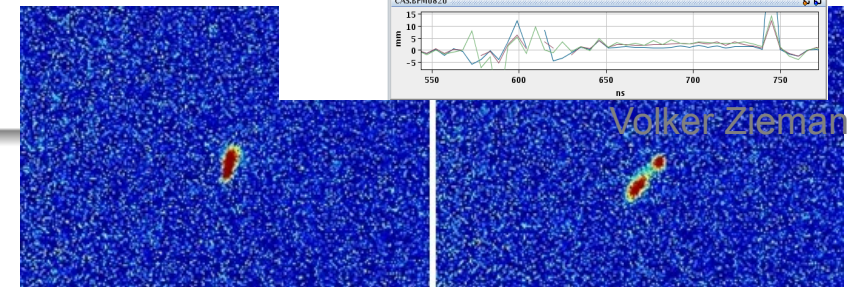
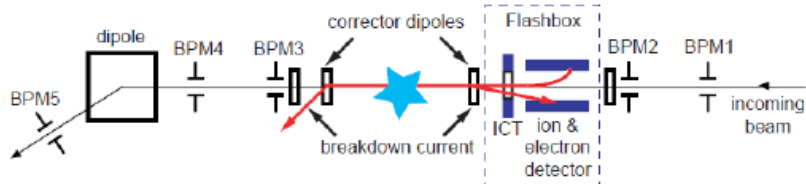
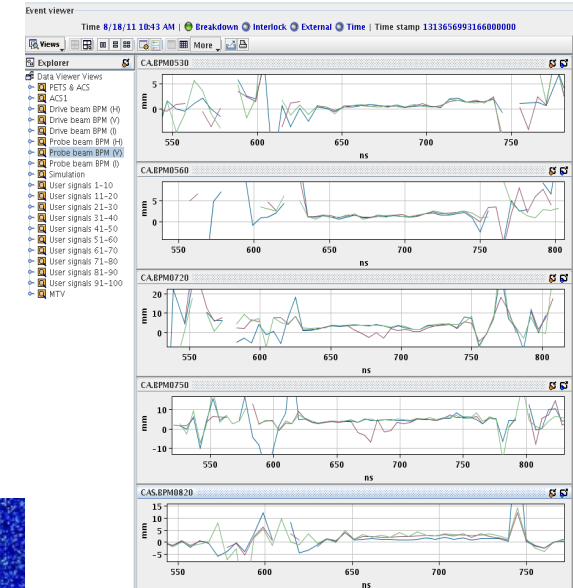


- Measurements of beam kick due to HOM and RF breakdowns both on the drive beam and on the probe beam  
(10  $\mu\text{m}$  BPMs resolution for 10 mrad angular resolution)

already in 2009 for the drive beam without considering incoming energy variation  
(CTF3-Note-098)

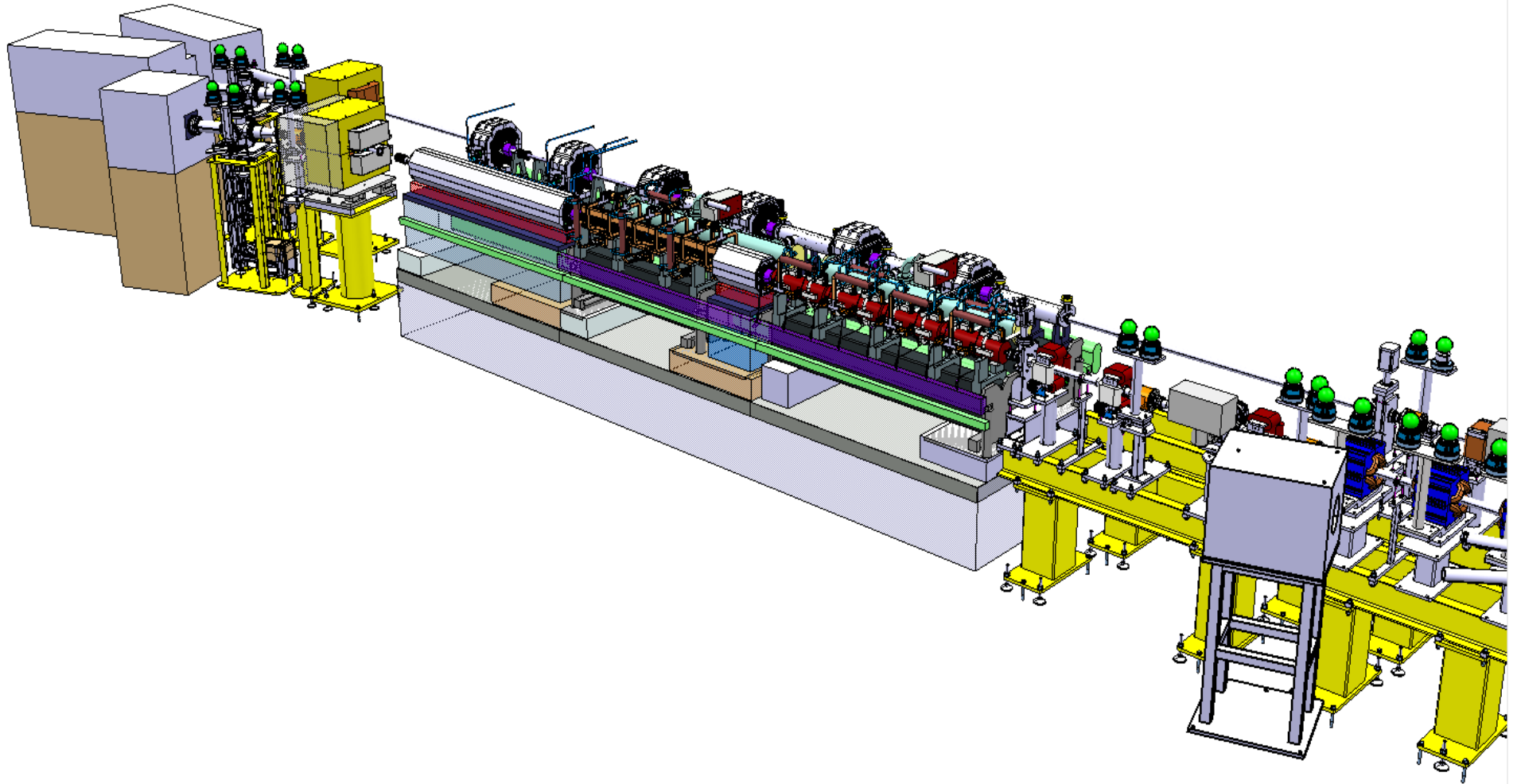


- better understanding of the breakdown process with:
  - indirect RF measurements (reflection during breakdowns);
  - direct measurements of emitted electrons and ions (flashbox).





# Future: TBTS, phase 3



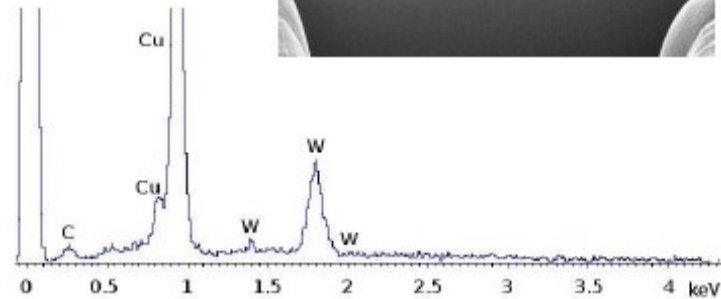
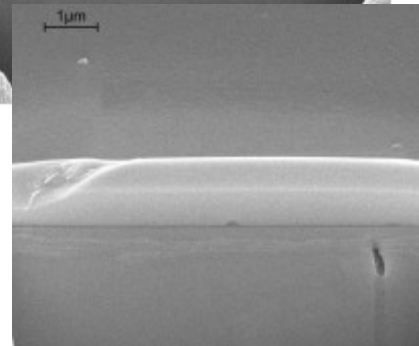
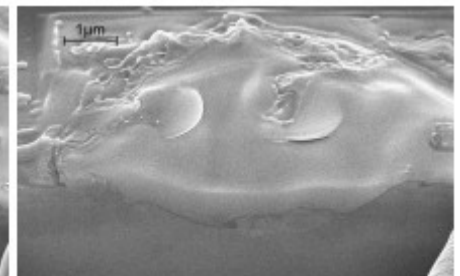
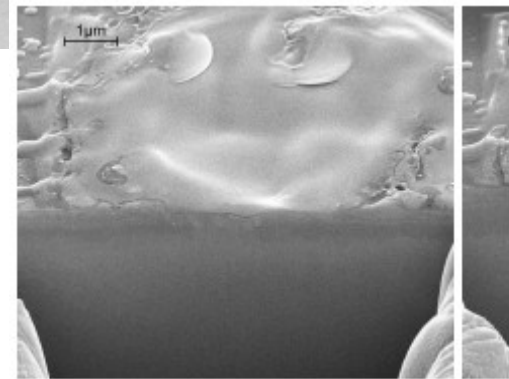
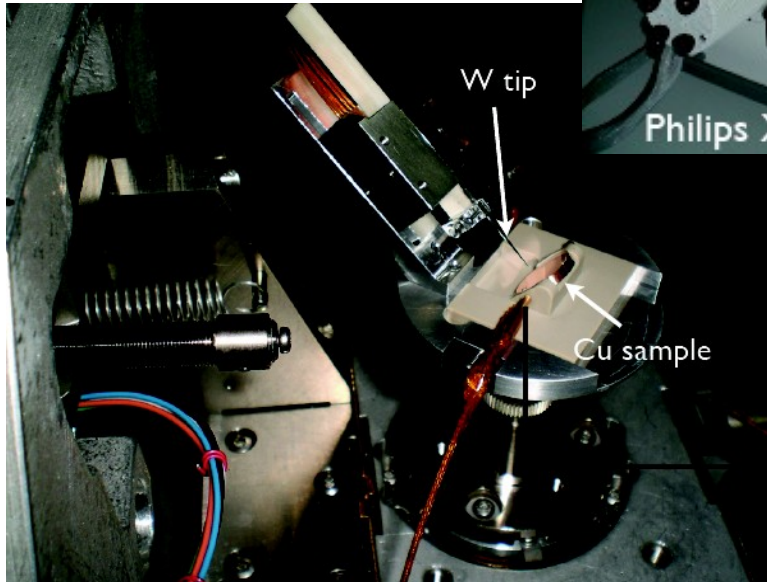
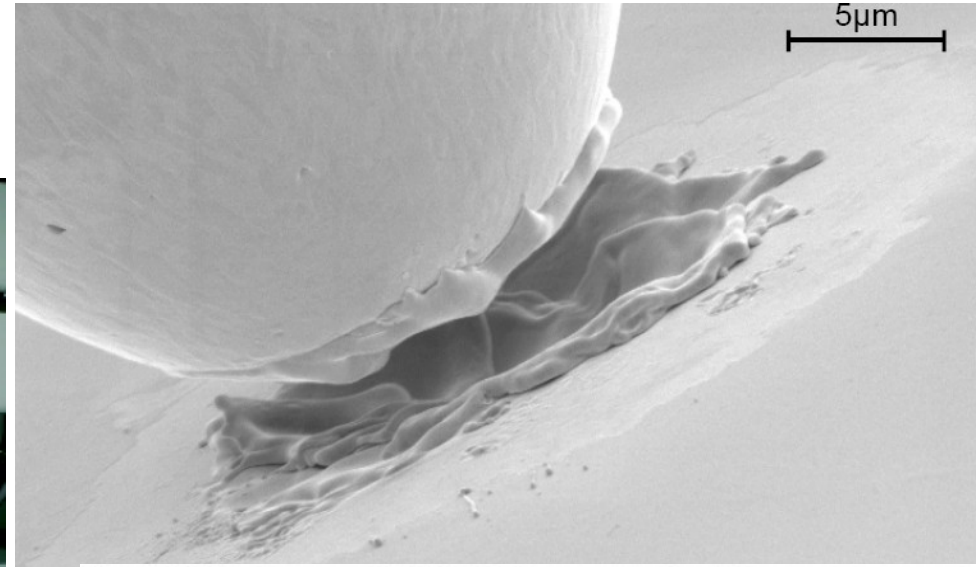
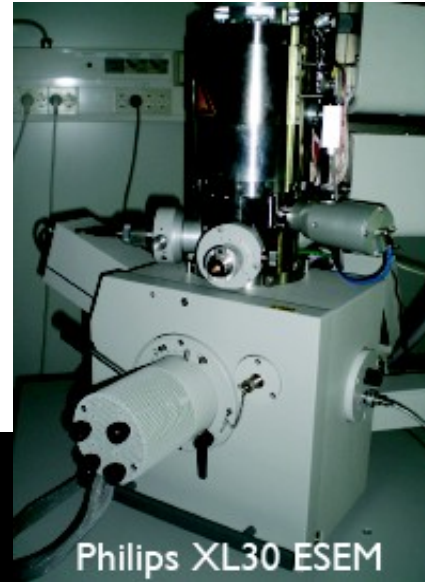
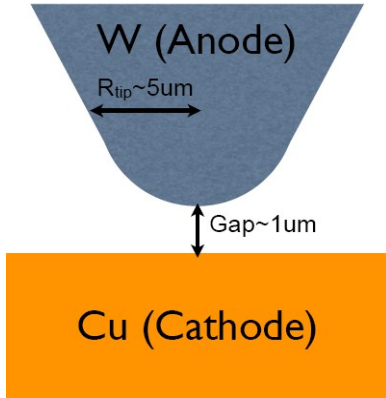


# Discharges in SEM



T. Muranaka MeVArc 27-30 June 2011, Helsinki

$1\text{kV}/\mu\text{m} = 1\text{GV}/\text{m}$

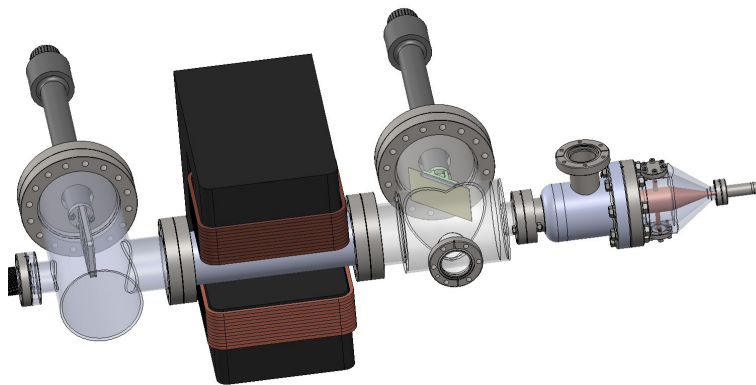
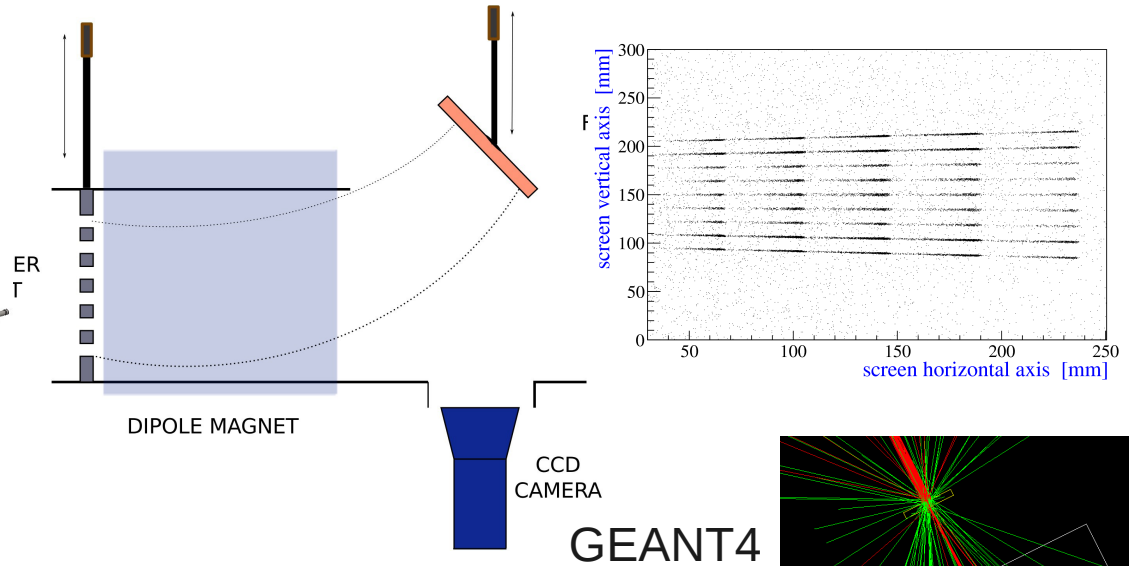
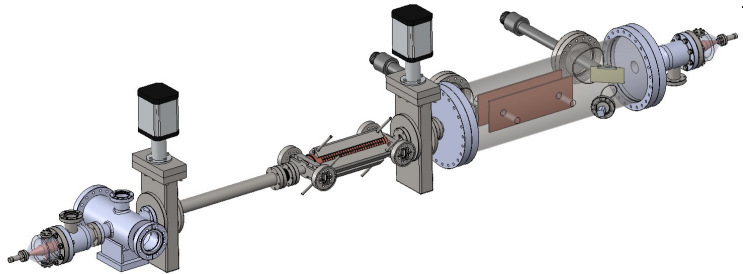




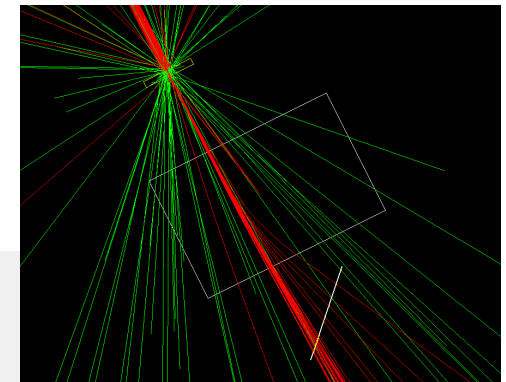
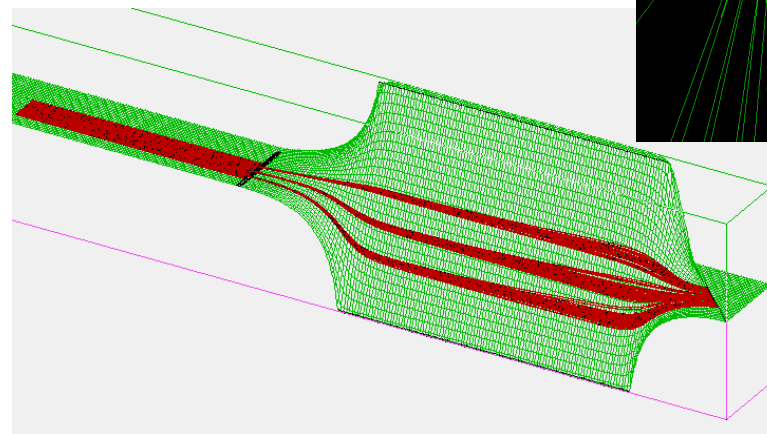


# Diagnostics for 12GHz test stand

- Pepperpot plus Spectrometer



Simion



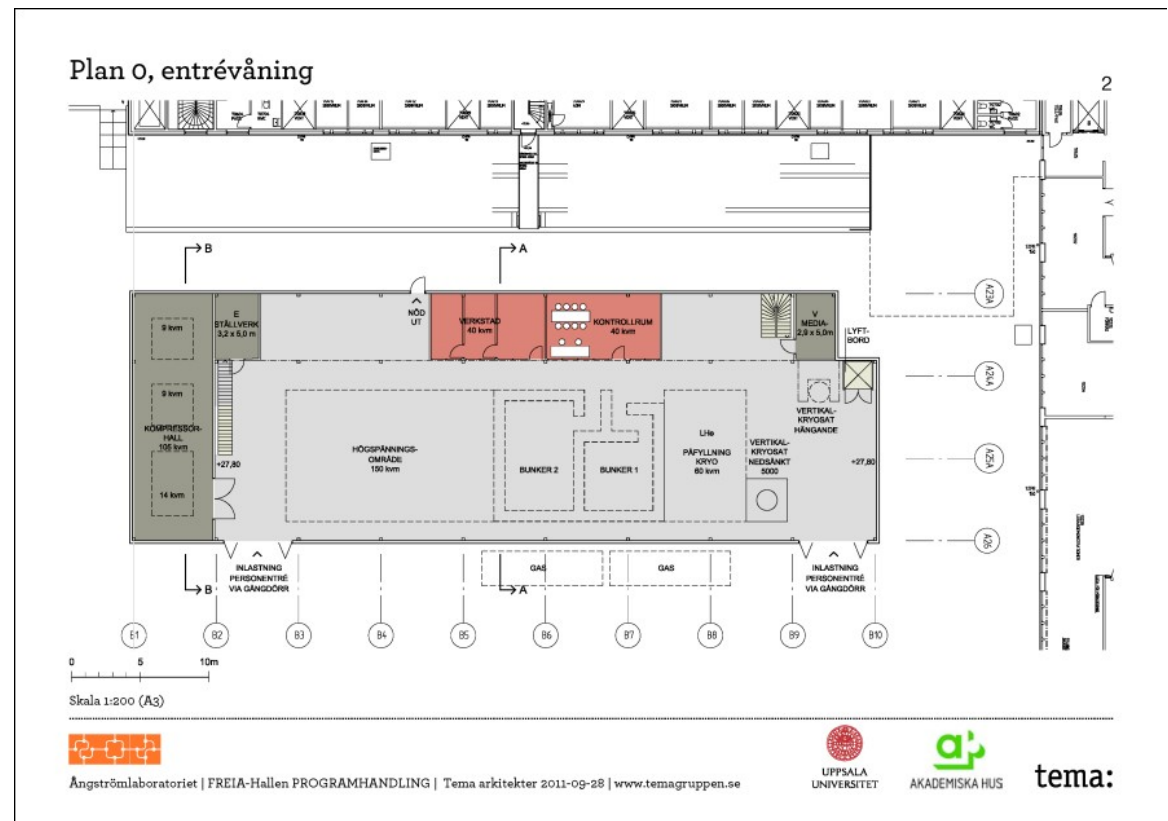
M. Jacewicz



# Vision: A 12 GHz test stand in Uppsala

- ESS activities triggered construction of FREIA hall.
- Application for planning grant to the Swedish Research Council submitted in April

- Space for 12 GHz tests in FREIA experimental hall





# Funding situation

Expected resources		2012	2013	2014	2015
Funded	Material budget [CHF at current rate] funded	36	20	30	35
	Manpower at institute [FTEyears] funded	1	1	0.5	0.5
	Manpower at CERN [FTEyears] funded	1	1	0.5	0.5
Applied for	Material budget [CHF at current rate] applied	115	95	100	110
	Manpower at institute [FTEyears] applied	1	1	1	1
	Manpower at CERN [FTEyears] applied	1	1	1	1

Through the grapevine...

- PhD student for TBTS did not go through
- Material physics application neither (not in table)



# Conclusion

# NORDUCLIC

- Uppsala is an active partner in the CLIC collaboration with a diverse portfolio
  - TBTS, electron microscopy, 12 GHz test stand
- Future
  - continue with operating the TBTS
  - and evolve into TBTS phase 3
  - diagnostics for the 12 GHz test stand
  - electron-microscopy
- Vision
  - a 12 GHz test stand in Uppsala