

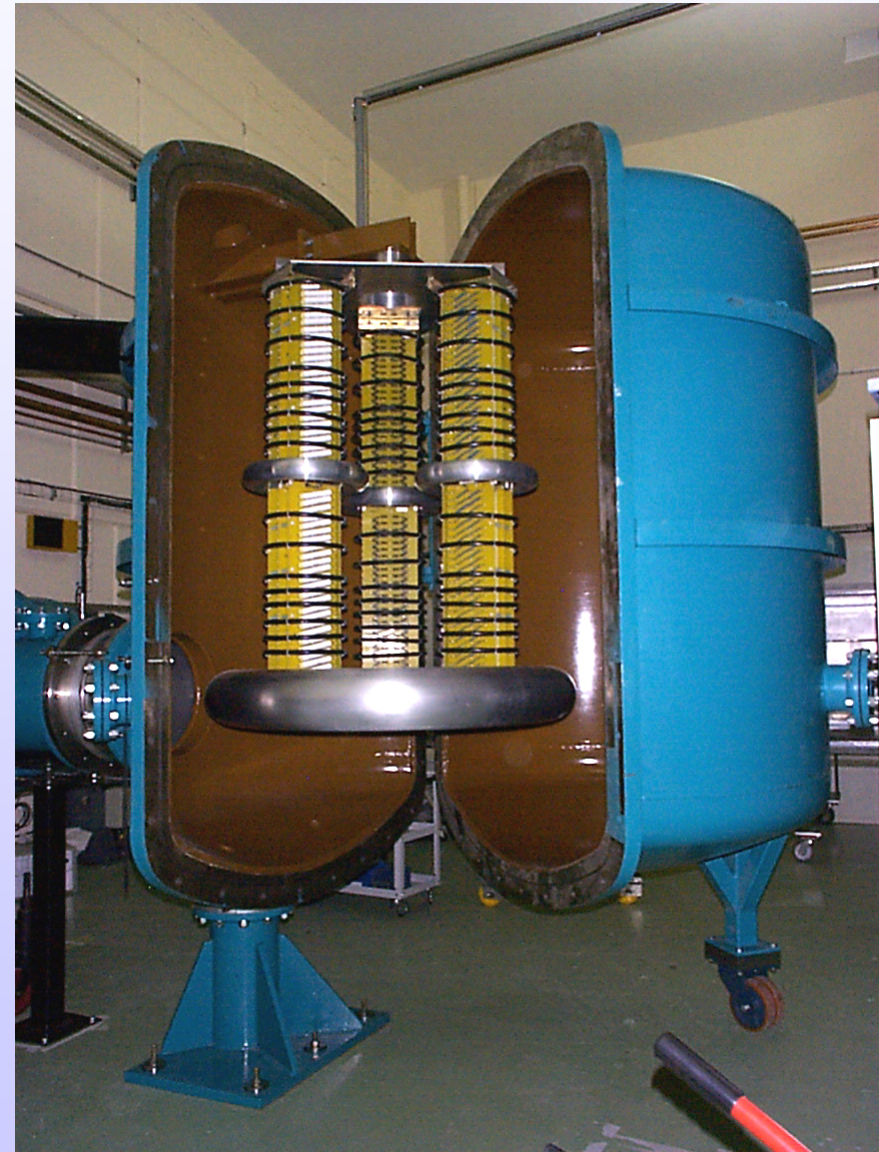
# ASTeC developments

Andrew moss

- SRS Status
- Energy Recovery Linac Prototype
  - Latest news
  - Status of the RF system
  - Status of the cryogenic system
- 4GLS status

- Machine currently recovering after a major shutdown
- Main klystron changed to an EEV tube
- New Thales 250KW klystron ordered for July 2006
- Upgrades to SRS user facilities continue – Vertical polarisation undulator
- Decision to close SRS facility December 2008
- 25<sup>th</sup> anniversary celebration October 2005

- Test accelerator is being built rapidly
- Photocathode Gun testing Dec 05
- Booster and Linac cavity install Feb 06
- Cryogenic commissioning 4 weeks from Feb 06



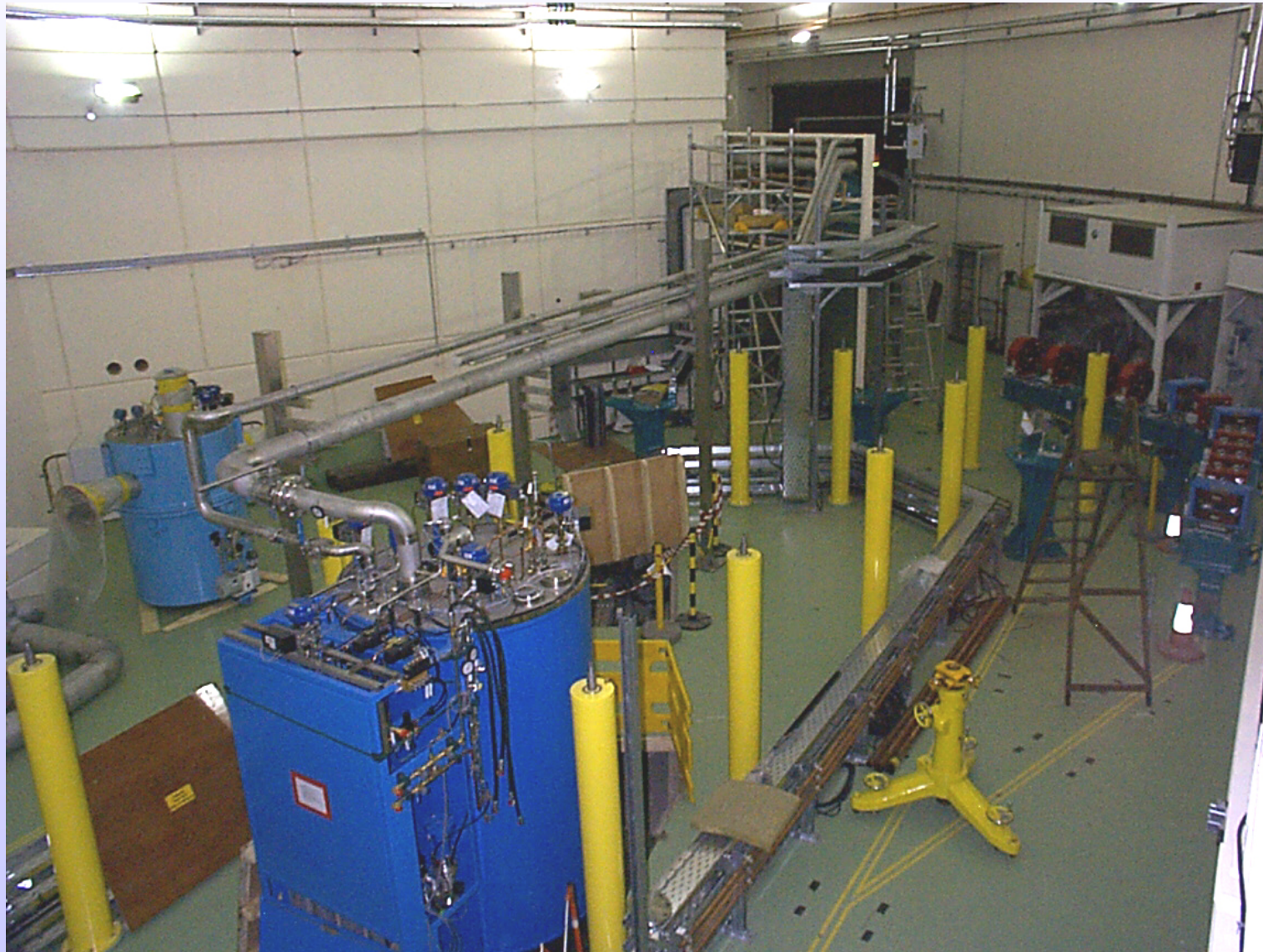








**4GLS**  
**DARESBUY**







**4GLS**  
DARESBUY



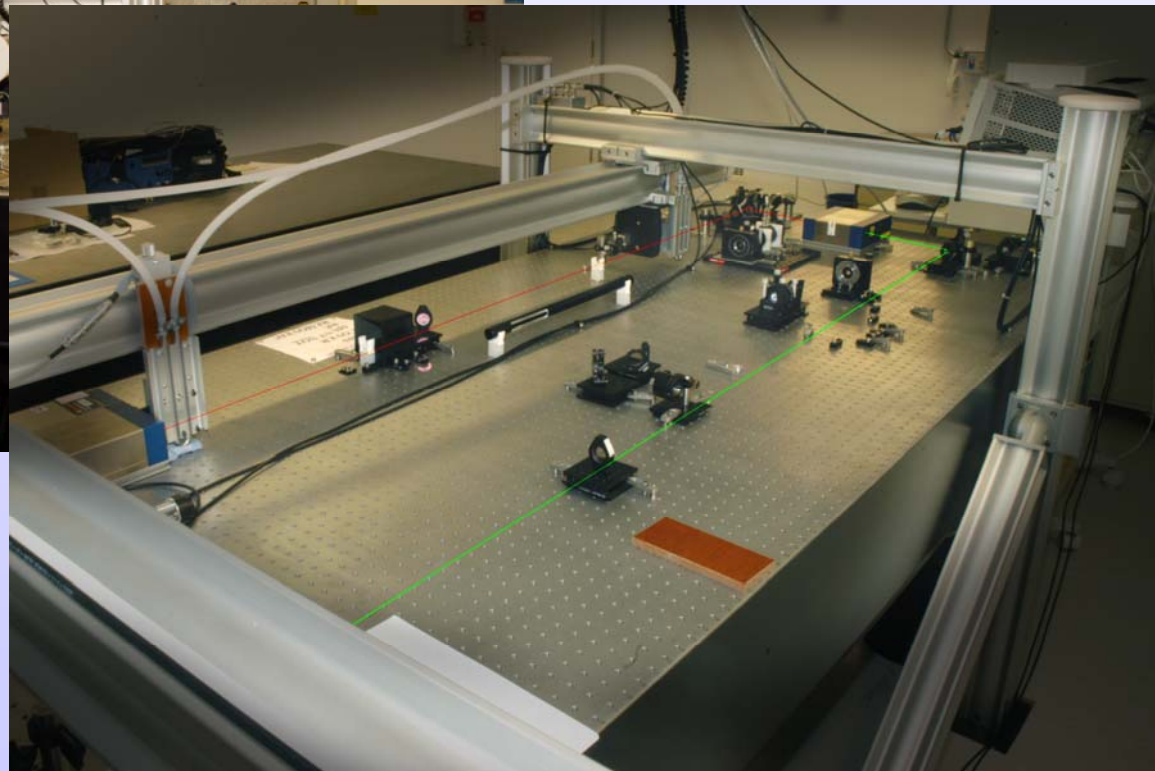
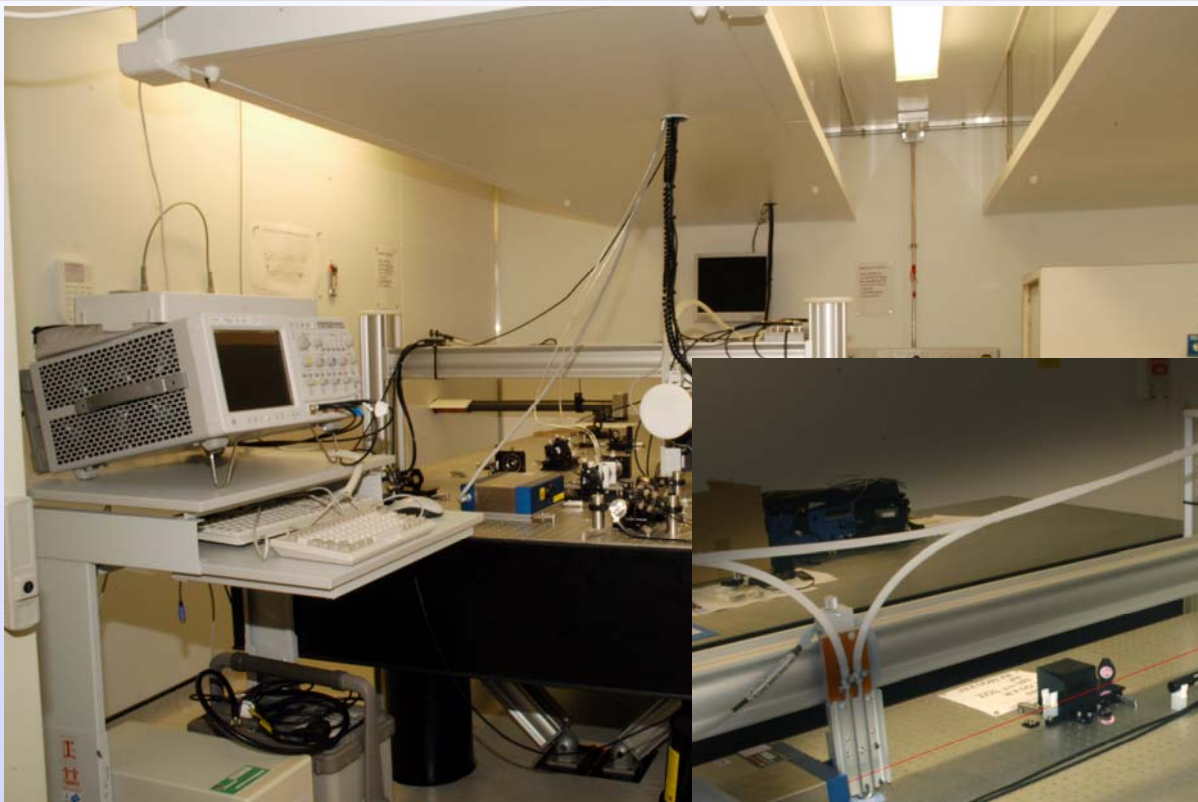




**4GLS**  
**DARESBUY**

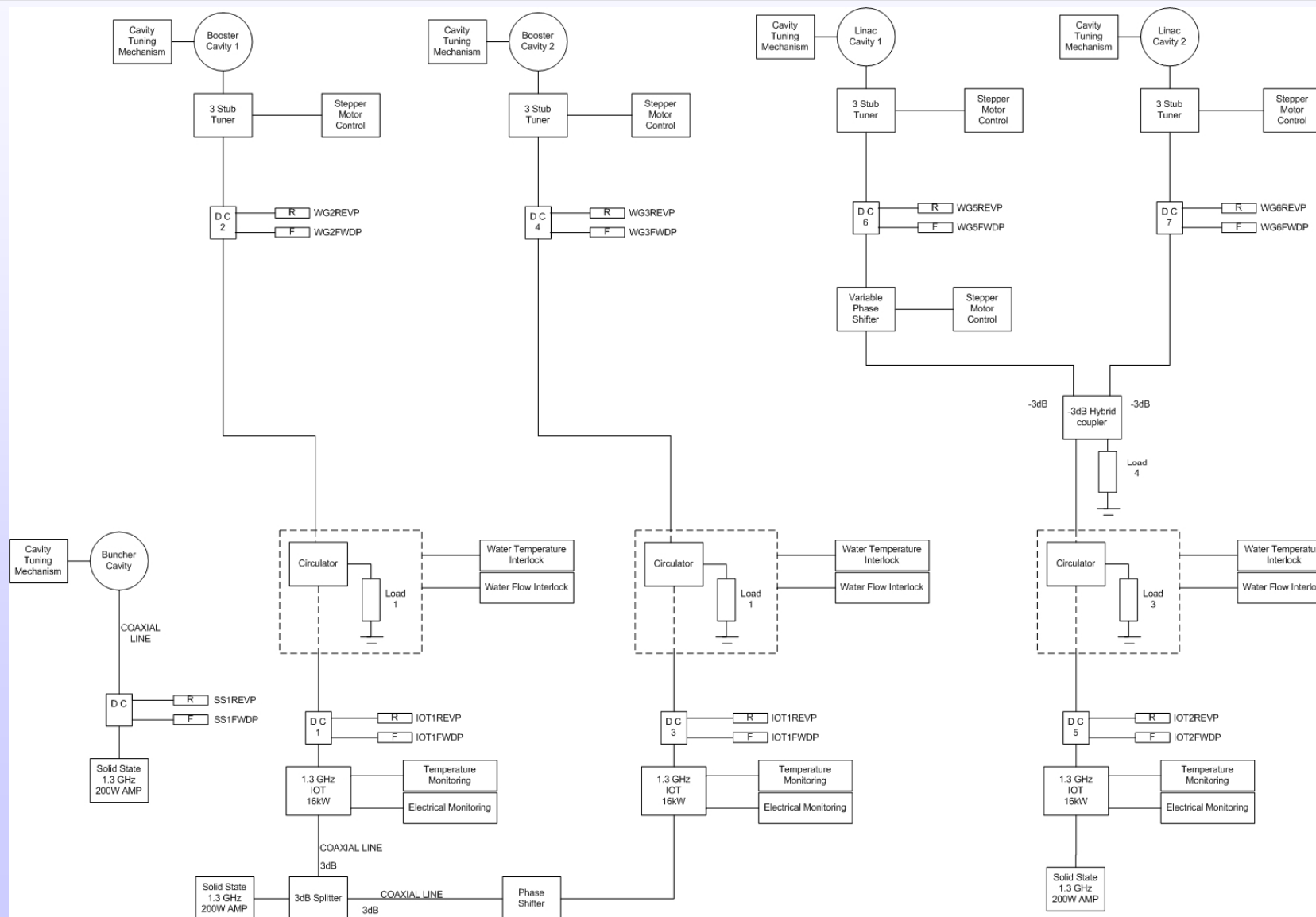






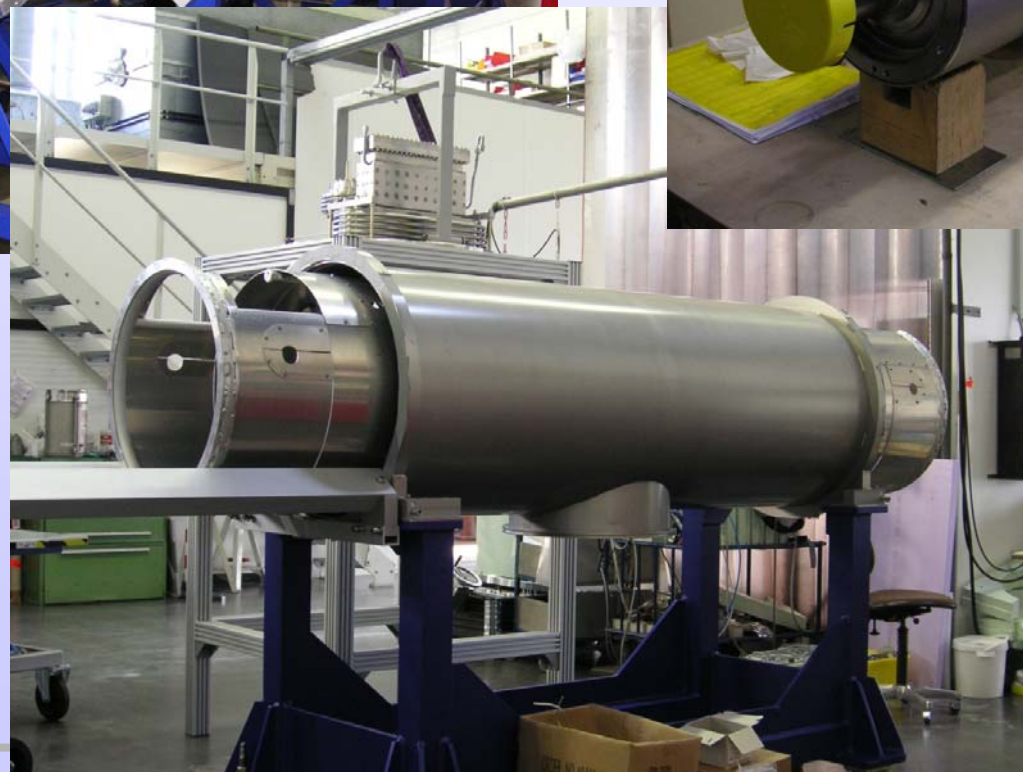
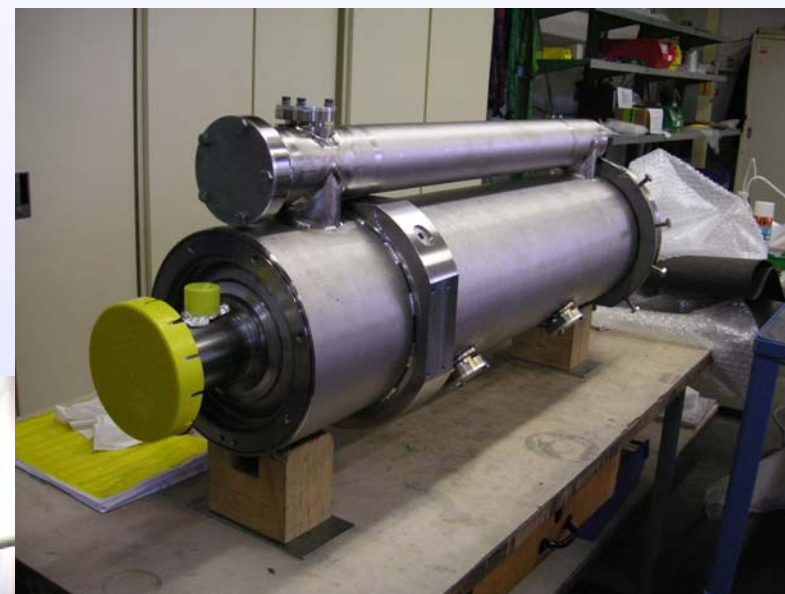


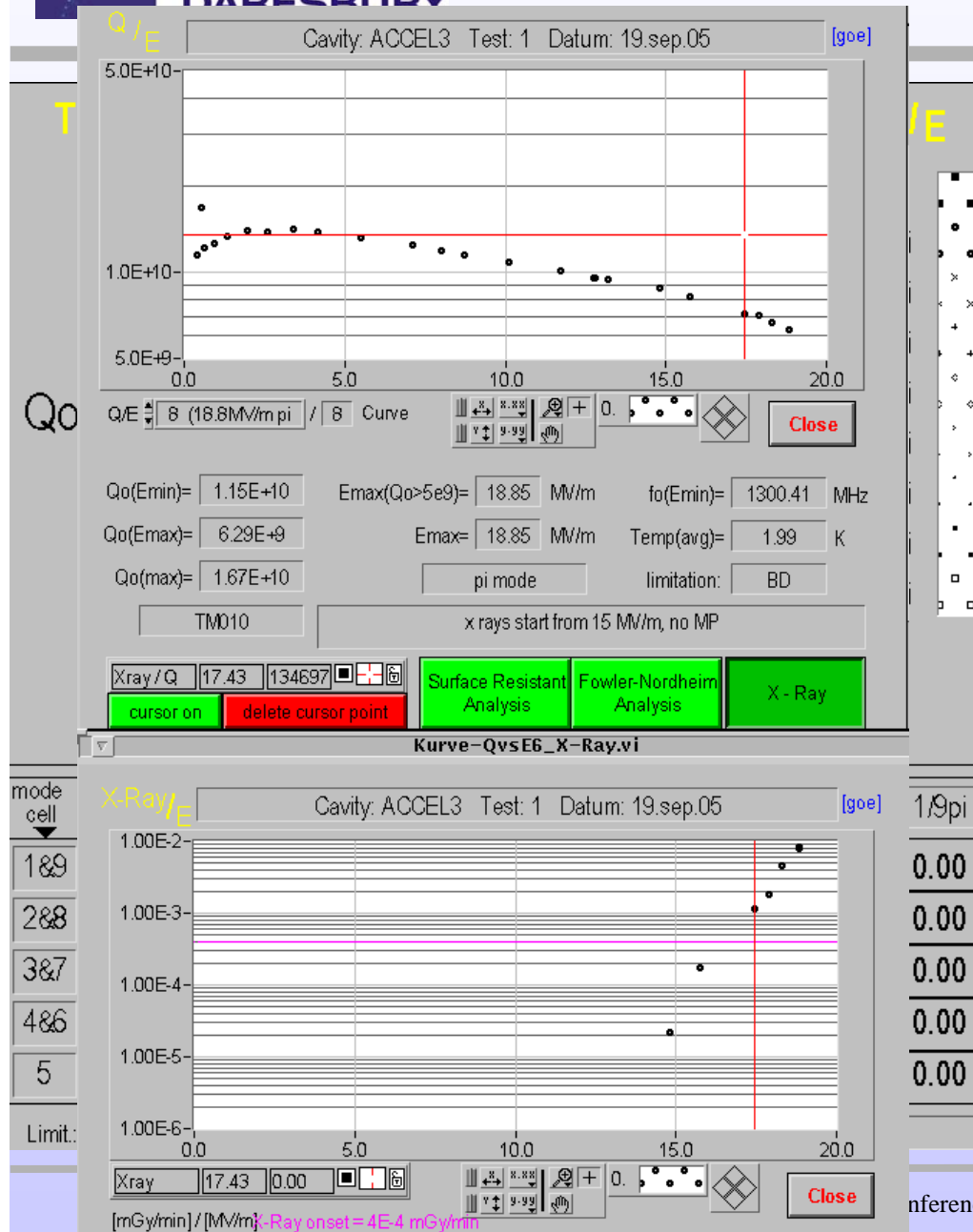




- Cavities
  - 2 Tesla cavities in a cryomodule made under license by ACCEL (Stamford UNI/Rossendorf)
  - Vertical tests of structures carried out at DESY
  - Initial tests only produced 6MV/m re-cleaning has brought ~ 20MV/m
  - First module due to DL December 05
  - Second module will arrive Jan 06







- 3 cavities now tested
- All above required spec ~15MV/m
- No Q disease evident
- Cells between 19.1 – 21.1 MV/m



- 2 Inductive output tubes on site
  - 1 off frequency prototype
  - On spec IOT waiting to test on DL HV psu
  - 2 ready to ship at e2v
  - Thales have tube ready which we will test on the ERLP
- HV PSU ready for tests
  - 50KV 18 A
  - Will power ERLP RF
  - Can be used for any RF tests !!!



## Phase Noise

- Source – 10MHz double oven
  - Aging stability
    - $5 \times 10^{-9}$ /year
    - $3 \times 10^{-11}$ /day
    - 0 to 50 C
- Oscillators
  - Vectron PLL (used at Rossendorf)
  - Wenzel multiplier

10Hz	-126 dBc/Hz
100Hz	-141 dBc/Hz
1KHz	-143 dBc/hz
10KHz	-143 dBc/Hz

Offset (in Hz)	81.25 MHz (in dBc/Hz)	1.3 GHz (in dBc/Hz)
10	-93	-69
100	-123	-99
1 k	-154	-130
10 k	-168	-144
100 k	-168	-144



- Analog LLRF card bought from FZ Rossendorf
- Phase control to 0.03 Deg.
- Voltage control to  $2 \times 10^{-4}$  (25dB range)

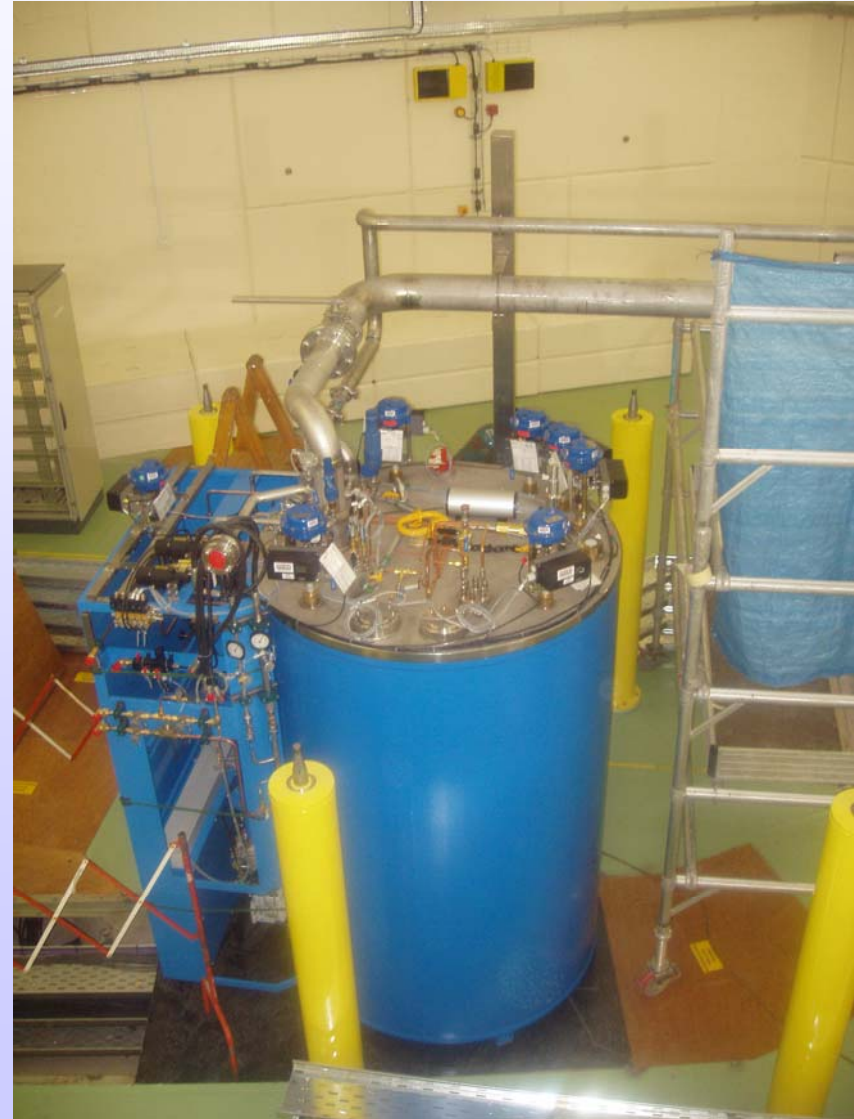








- Linde TCF 50 fridge
- 4K coldbox installed
- commissioning Dec 05
- Ambient helium pipework installed
- DeMaco Helium transfer lines on site
- N2 lines installation from Sept 05
  - 50% complete





- 2 K pumping system installed, commissioning Feb 06
- 100 Watts



- £1.6M for technical design review starting April 05
- Collaborations with: -
  - Rossendorf
  - Stamford
  - Berkley
  - Jlab
  - Electtra



# Conceptual Layout of 4GLS

