



News from HZB / BESSY

Wolfgang Anders at ESLS-RF Meeting September 2010 Trieste

- **Status Klystrons / IOT**
- **Modifications of transmitters**
- **New LINAC for BESSY II**
- **Status *BERLinPro***
- **HoBiCaT Extension -- SRF Injector**

• Status Klystrons / IOT

– Booster Transmitter:	~ 94.000 h	Valvo	YK1263
– SR Transmitter 1:	~ 80.000 h	Thales	TH2133 → instable → change
– SR Transmitter 2:	~ 90.000 h	Thales	TH2133
– SR Transmitter 3:	~ 85.000 h	EEV	K3755
– SR Transmitter 4:	~ 58.000 h	Thales	TH2133
– WWL IOT:	~2.5 years	CPI	CHK5900W1

• **90 kW IOT at WWL detuned by water cooling fault in 2008**

• **>1 year to get an offer for new IOT by CPI !!!**

- water leak on spare Thales klystron → bad soldering → easy repair but spare klystron (operated in Lund for the duration of one year in 1996), little vacuum leakage ? → defect
- → take second spare klystron
- → new Thales spare klystron several water leaks !!!!
- → last used spare now in operation



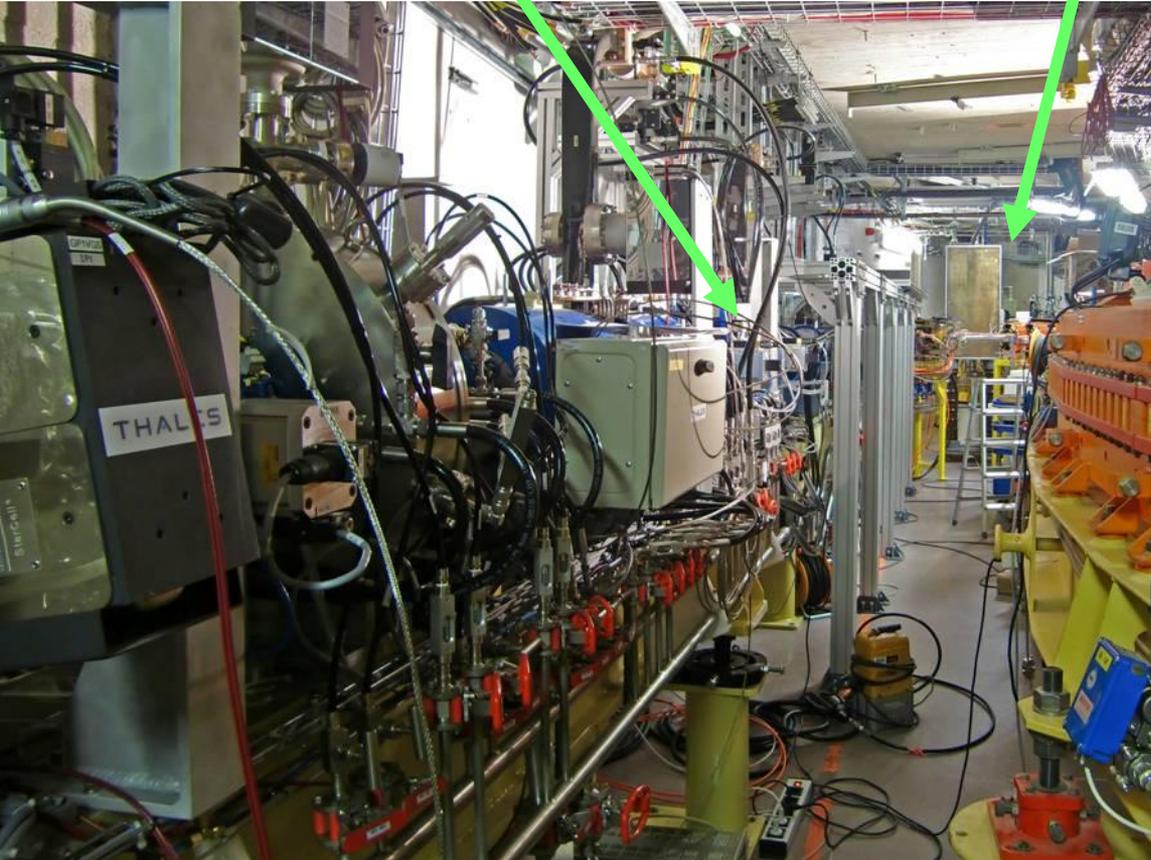
water leaks on new Thales klystron



- installed at every klystron: a high power coax switch to water load
- noise reduction analog LLRF phase detector changed, gain reduced
- circulator cleaning dust and metal swarves out of gap: WWL reduction of arcs
- loose N-connector after master clock → beam losses
- 20 Hz noise on storage ring transmitters: booster RF coupled to the phase detectors → better shielding implemented this shutdown
- HOM cavity at WWL, see talk Ernst Weihreter

new 50 MeV LINAC

old 50 MeV microtron



A 50 MeV LINAC has now been installed at BESSY II.

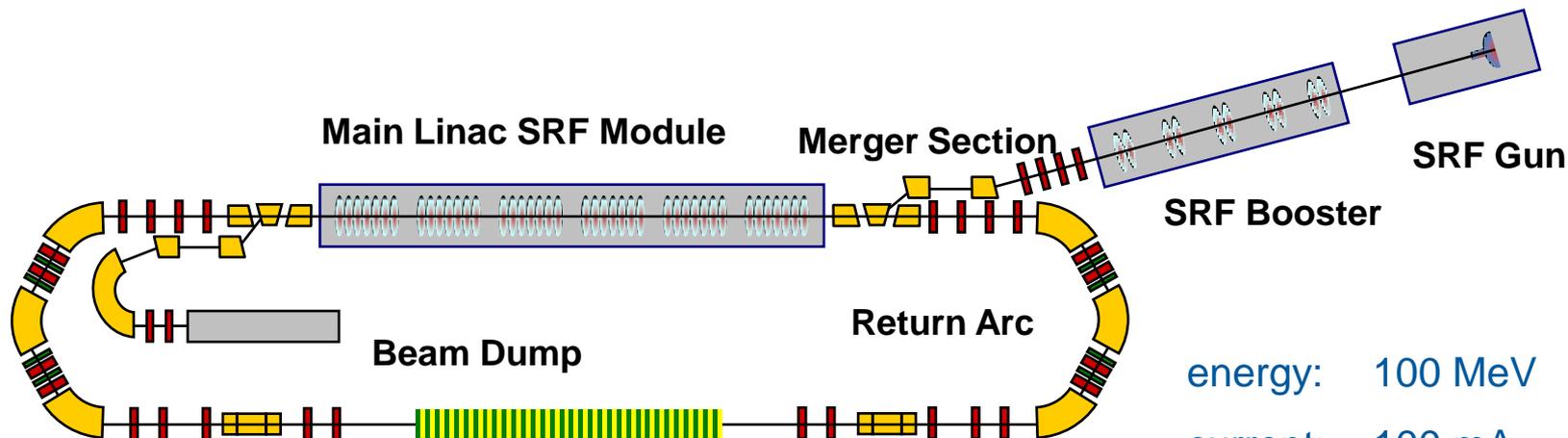
It gives more flexibility for bunch patterns, different hybrid modes and is designed to prepare top-up mode.

The RF of the new LINAC is operated with the Thales TH 2100 Klystron at 20 MW peak power. We will purchase a spare tube, but for safe operation two spares are required.

Who else uses the TH 2100 klystron so that we could share a second tube if need be?

Has anybody stored the TH 2100 with the manufacturer?





energy: 100 MeV

current: 100 mA

6 transmitter 10-15 kW

6 transmitter 100-150 kW

- SRF gun development, see next slide
- SRF booster module:
 - similar to Cornell module
 - five 2-cell cavities
- Main linac cavities:
 - Joint research project in collaboration with Dortmund and Rostock University



artists view of *BERLinPro* hall

Decision expected 8.10.2010



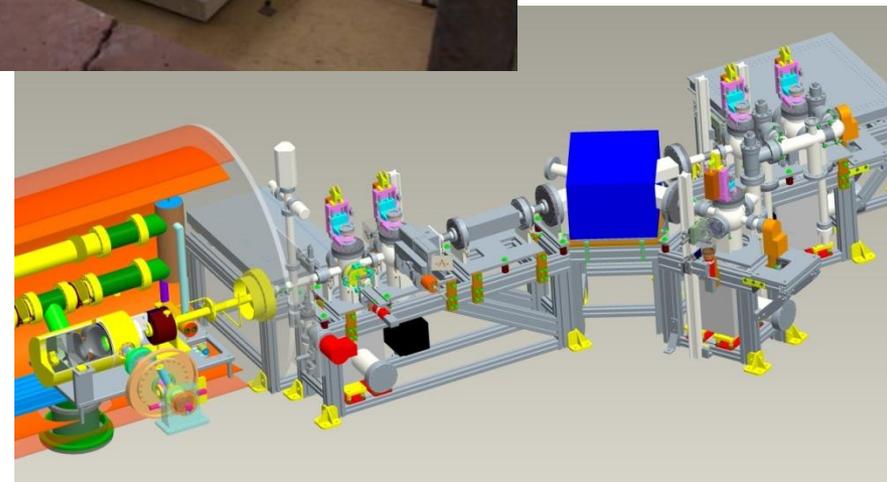
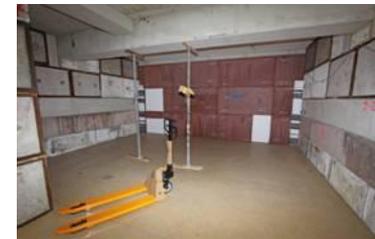
HoBiCaT extension for SRF Injector

The primary goals of the project are to initiate SRF gun R&D for ERL at HZB and to achieve a high-brightness electron beam with a 1 mm mrad normalized emittance with 77 pC bunch charge.

The effort pools expertise of the hybrid Nb/Pb SRF gun interest group led by Jacek Sekutowicz (SRF cavity, Pb coating), and HZB resources (cryomodule, beam diagnostics) and HZB/MBI (drive laser).

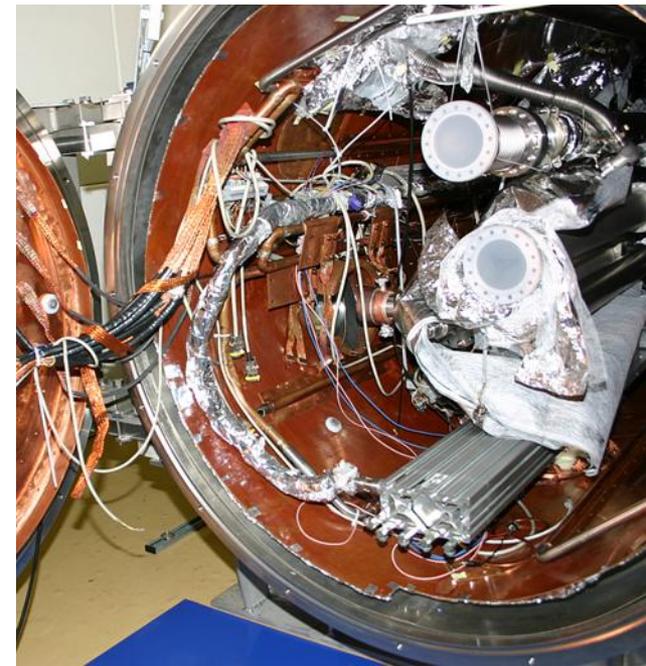
The next stage will be an SRF gun with NC cathode stock and semiconductor cathode to achieve high average current.

This gun will subsequently become an integral part of the *BERLinPro* ERL test facility.





1.5 cell SRF photo injector cavity produced by CEBAF in cooperation with HZB, DESY and the Soltan Institute (Poland).



HoBiCaT



coating a lead dot on the backplane as a photocathode



Thank You !