LCWS12 International Workshop on
Future Linear Colliders
University of Texas at Arlington, USA
22–26 October 2012

08:30 - 10:30 Instrumentation and Technical Systems and RF structure/Technologies

08:30 **Development of nanometer electron beam size monitor** ***by Jacqueline Yan (University of Tokyo)***

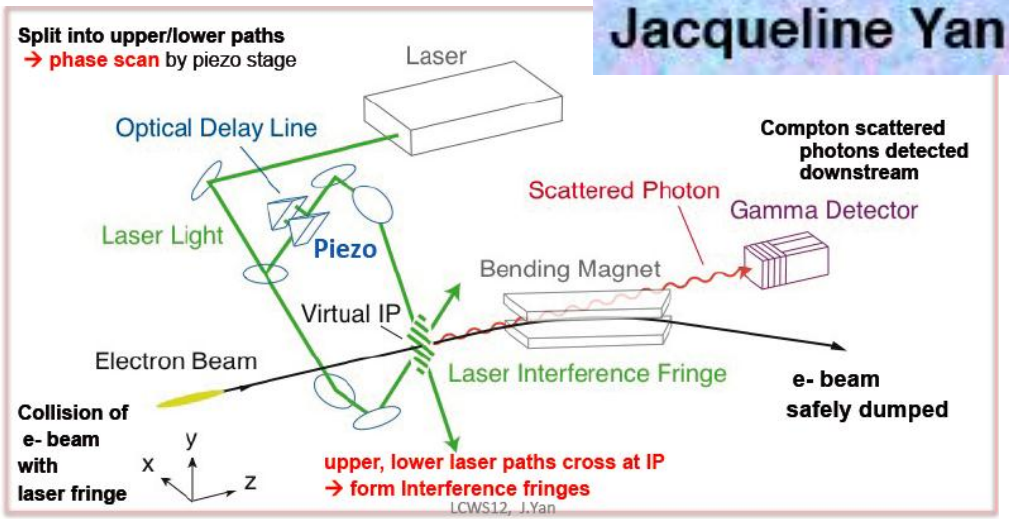
09:00 **Two-beam module development program: status and future plans** ***by Germana Riddone (CERN)***

09:30 **Status of Design and Prototype Procurement for CLIC 2-Beam Module Magnets** ***by Michele Modena (CERN)***

10:00 **Conduction cooled SC magnet** ***by Vladimir Kashikin (FERMILAB)***

Measurement of Nanometer Electron Beam Sizes with Laser Interference using IPBSM

Jacqueline Yan



Beam time status in 2012

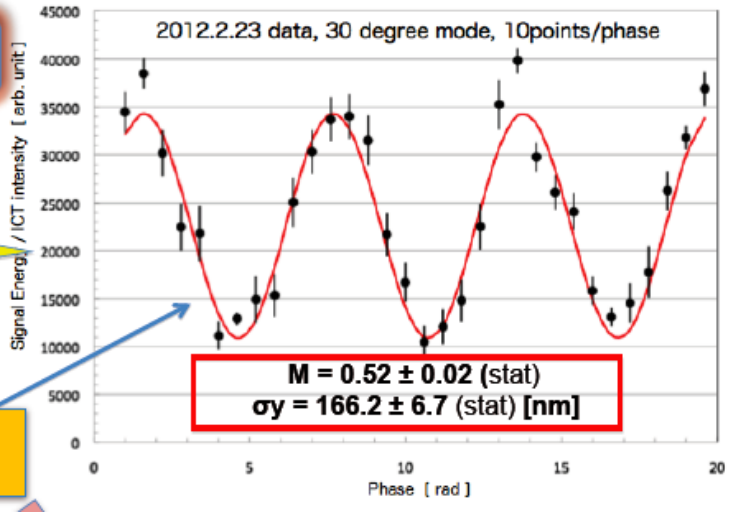
full commissioning of 30° mode

First Modulation detection

(10 x β_x*, 10 x β_y* optics)

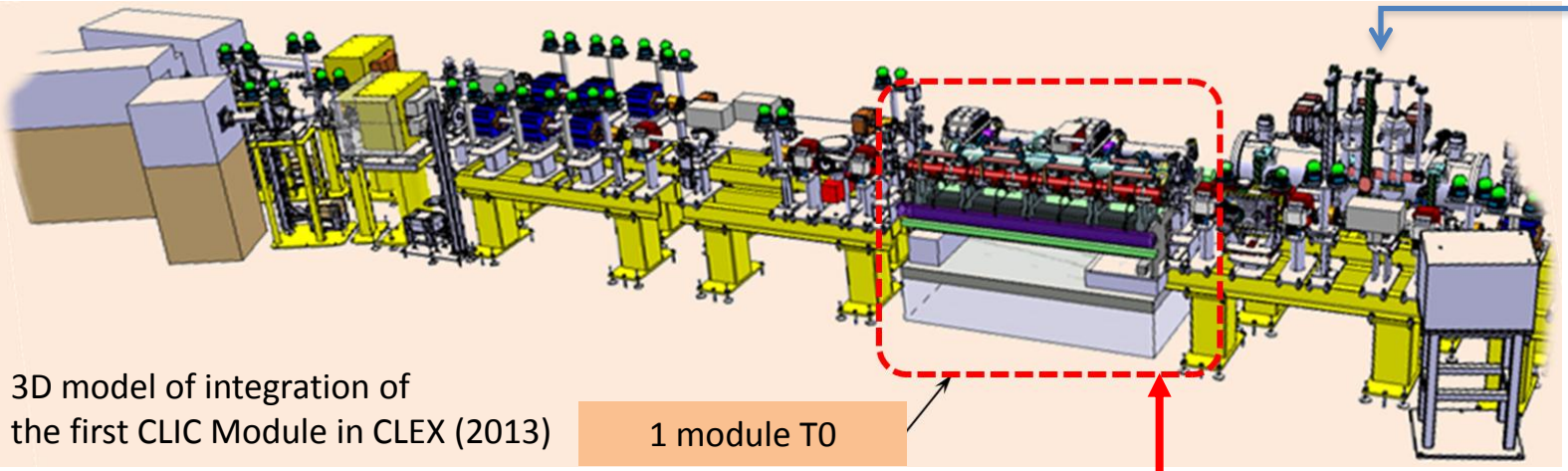
stably measure $\sigma y^* \sim 160$ nm

(10 x β_x*, 3 x β_y* optics)



Prototype modules in CLEX

2013

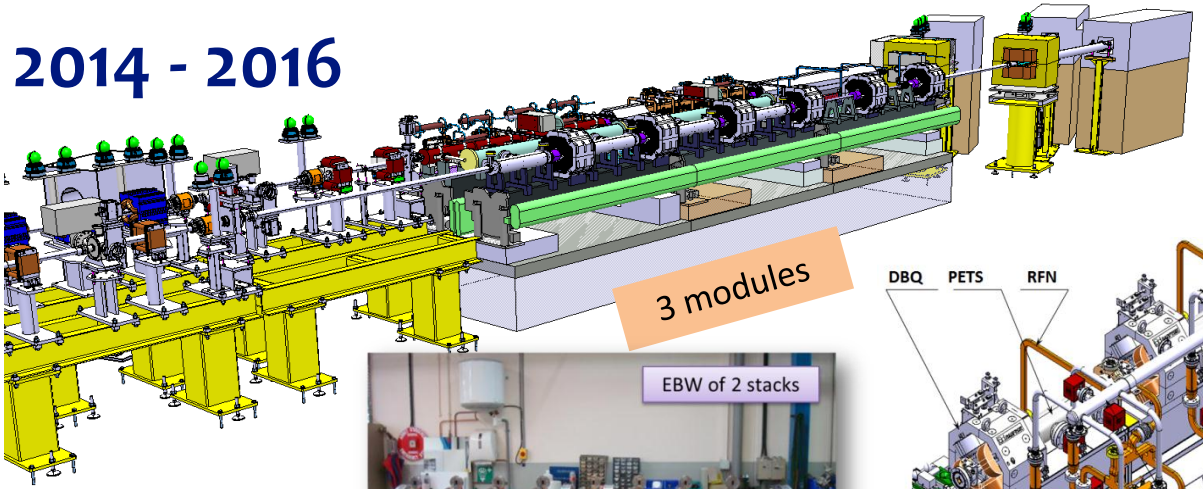


3D model of integration of
the first CLIC Module in CLEX (2013)

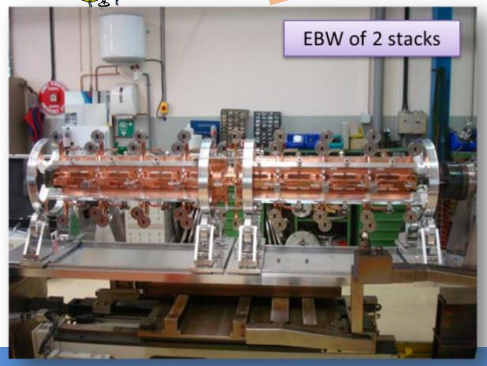
1 module T0

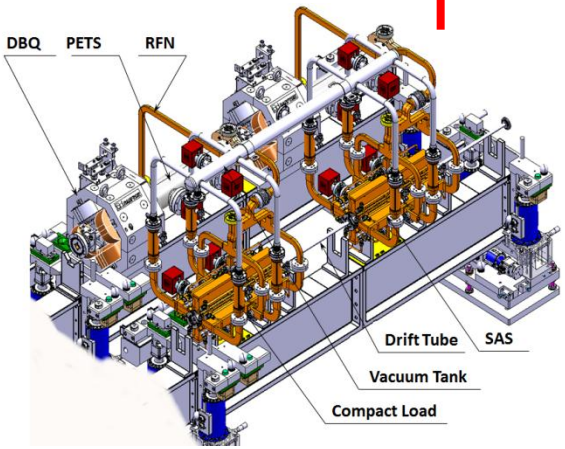
TBTS PETS tank

2014 - 2016



3 modules

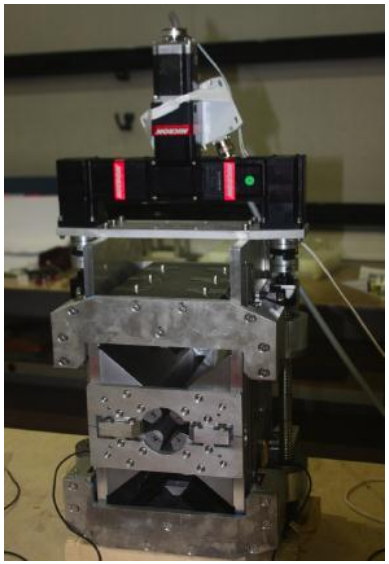




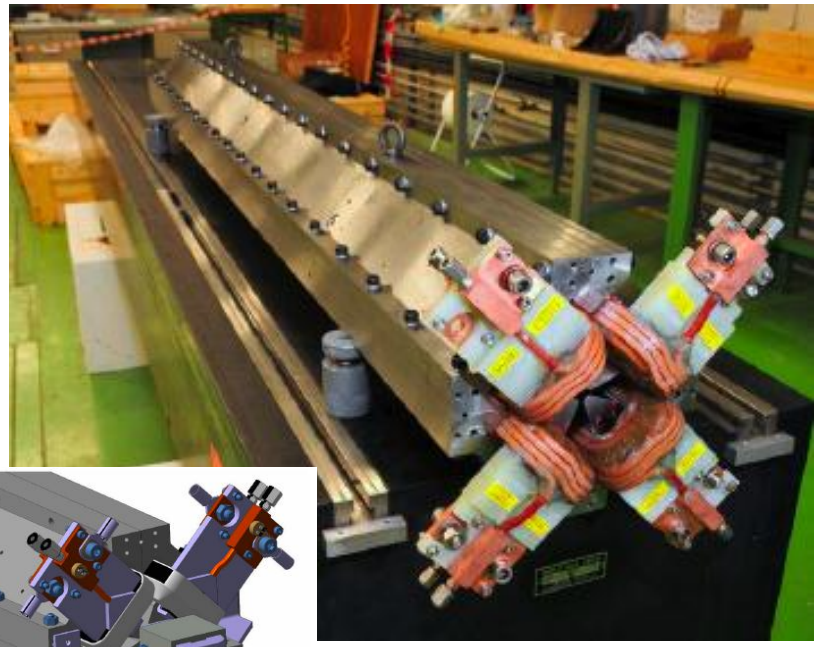
Status of Magnet R&D for the CLIC "2-Beams Modules"

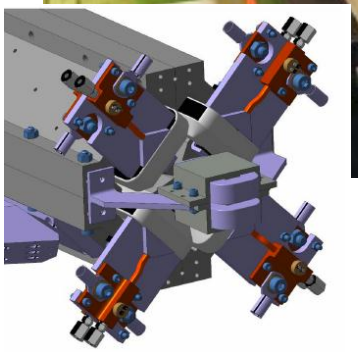
Michele Modena, CERN-TE/MSC

Drive Beam Quadrupole R&D Status:



Main Beam Quadrupole R&D Status:

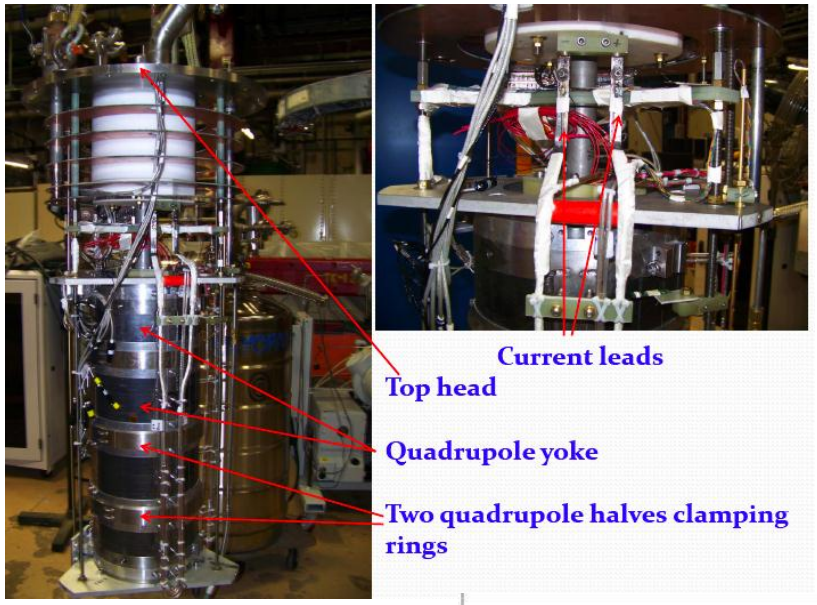


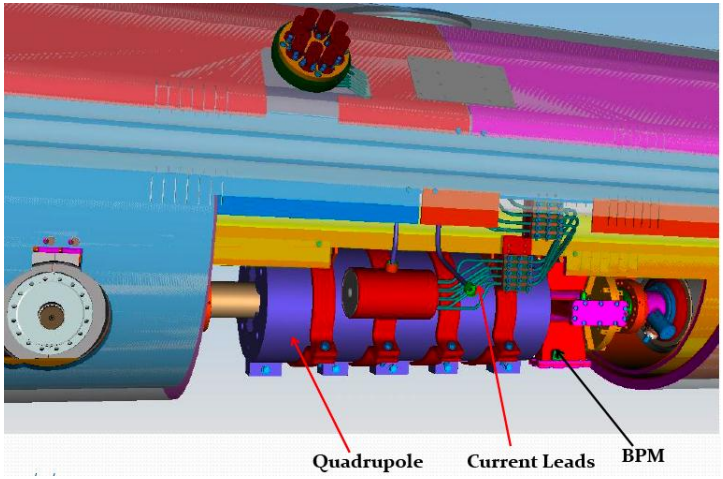


Main beam steerers

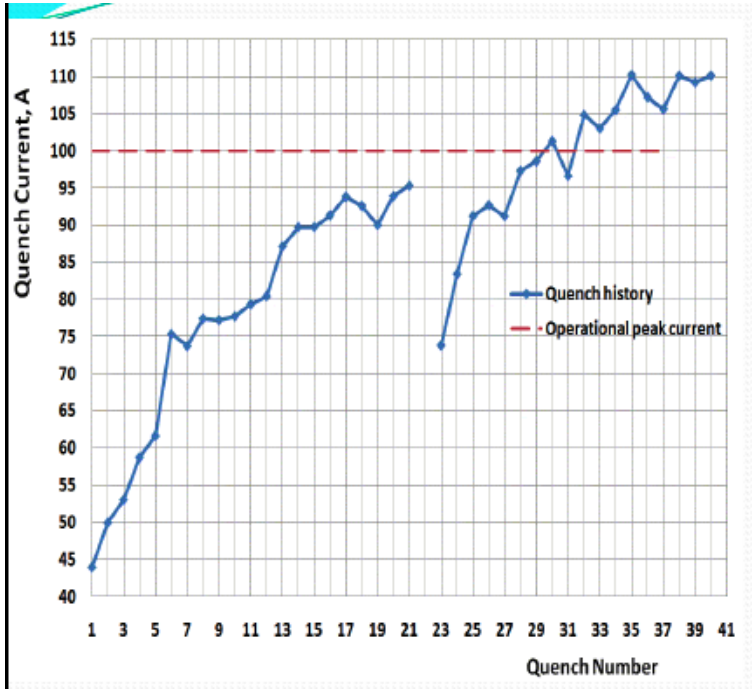
Conduction Cooled SC Magnet

Vladimir Kashikhin for US-Japan Collaboration



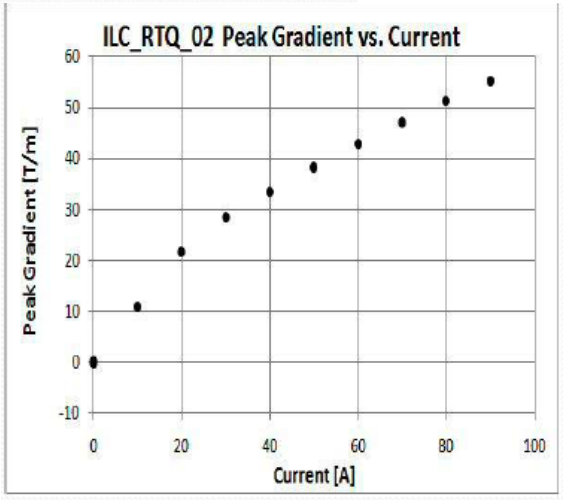


Quadrupole Training and Quench History



Magnetic Gradient Measurements

At 90 A current the quadrupole reached the specified peak gradient 54 T/m.



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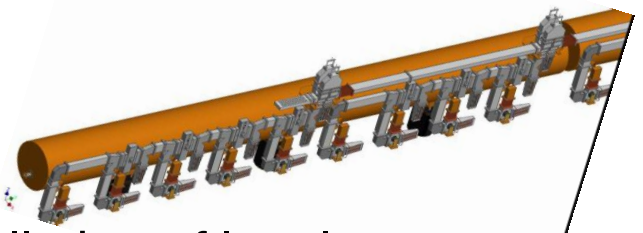
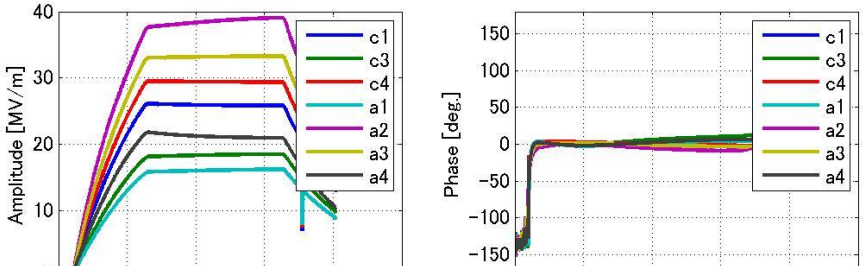
11:00 - 12:30 Instrumentation and Technical Systems and RF structure/Technologies

11:00 **STF-LLRF system and its study plan *20***	***by Dr. Shinichiro Michizono (KEK)***
11:20 **Power distribution system**	***by Dr. Shigeki Fukuda (KEK)***
11:40 **KCS big pipe results**	***by Chris Adolphsen (SLAC)***
11:50 **CLIC Drive Beam Linac**	***by Rolf Wegner (CERN)***
12:10 **Synchronization system for CLIC crab cavities**	***by Benjamin Woolley (Lancaster University)***

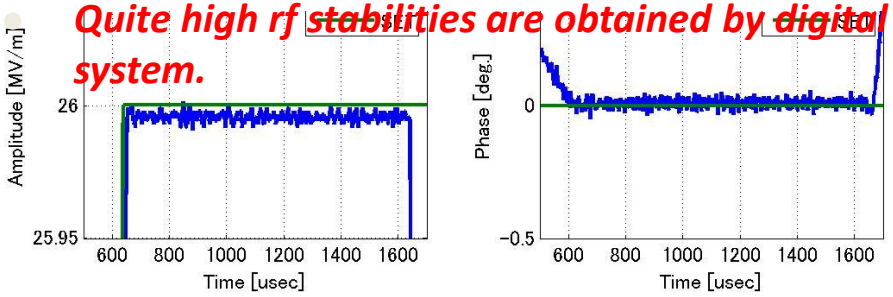
ILC superconducting rf system

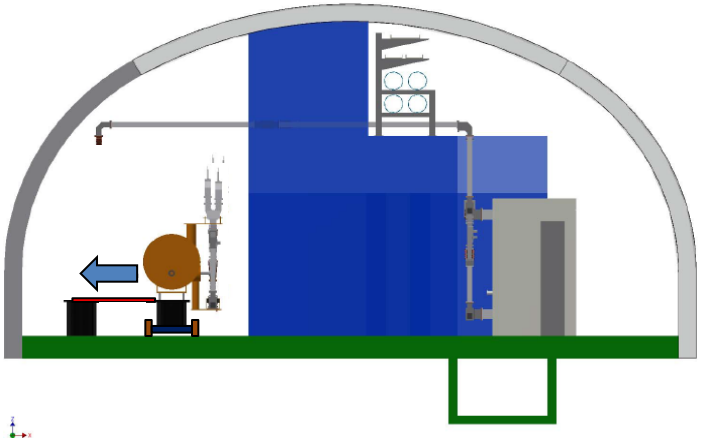


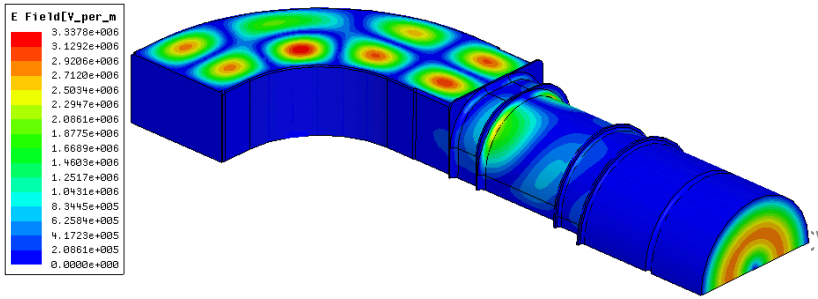
Installation of local power distribution system is proposed for KCS and DKS.



- ***0.0067%rms (in amplitude)***
- ***16.5mdeg.rms(in phase)***
- ***Quite high rf stabilities are obtained by digital FB system.***



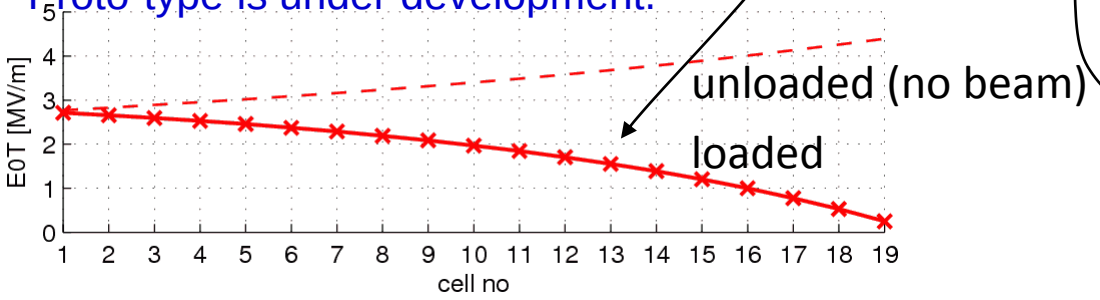




1.25 MW input (313 MW field equivalent – KCS needs only 190 MW initially), one breakdown in 140 hours with 1.6 ms pulses at 3 Hz

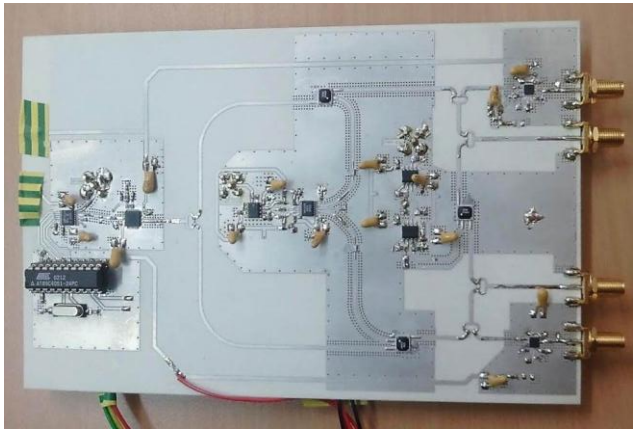
CLIC rf issues

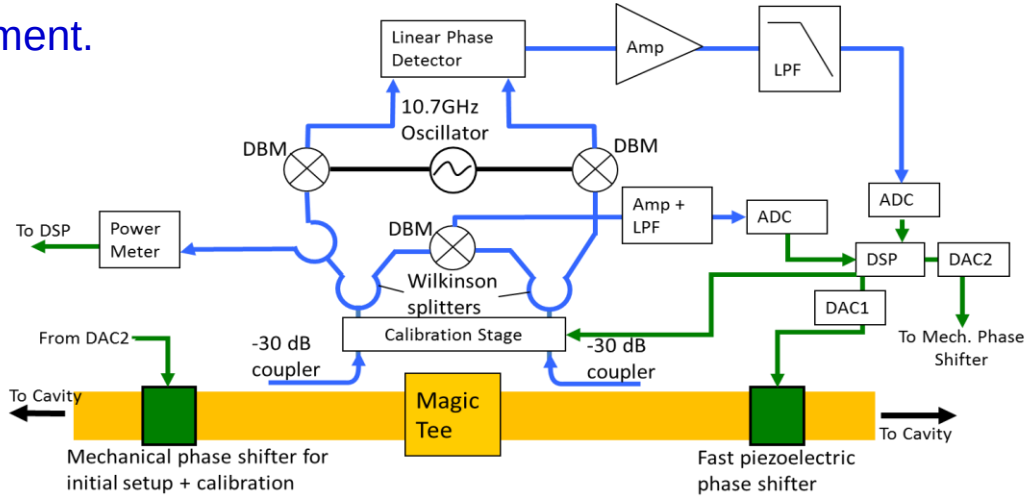
-Highly stable modulator (reproducible ~10ppm),
-high efficiency klystron (~70%),
-high power conversion efficiency (~95%) structure will be used at drive beam linac.
Proto-type is under development.



Modulator main specifications			
Pulse voltage	V_{kn}	150	kV
Pulse current	I_{kn}	160	A
Peak power	P_{out}	24	MW
Rise & fall times	**t_{rise}**	**3**	**µs**
Flat-top lenght	t_{flat}	140	µs
Repetition rate	Rep_r	50	Hz
Flat-top stability	FTS	0.85	%
Pulse reproducibility	**PPR**	**10**	**ppm**

- Crab cavity is essential for the high luminosity operation.
- High accurate phase control (1um for 40m long waveguides(WG)) between two crabs are required.
- Low thermal expansion WGs and Piezo phase-shifters will be used.
- Calibration analogue board is under development.





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14:00 - 15:30 Instrumentation and Technical Systems

14:00 **Linear Collider module control and stabilization** by ***Dr. Andrea Jeremie (LAPP)***
14:20 **Linear Collider Instrumentation** ***by Thibaut Lefevre (CERN)***
14:40 **Alignment challenges for a future Linear Collider** ***by Helene Mainaud Durand (CERN)***
15:00 **Summary of the Machine protection Workshop 2012** ***by Michael Jonker (CERN)***

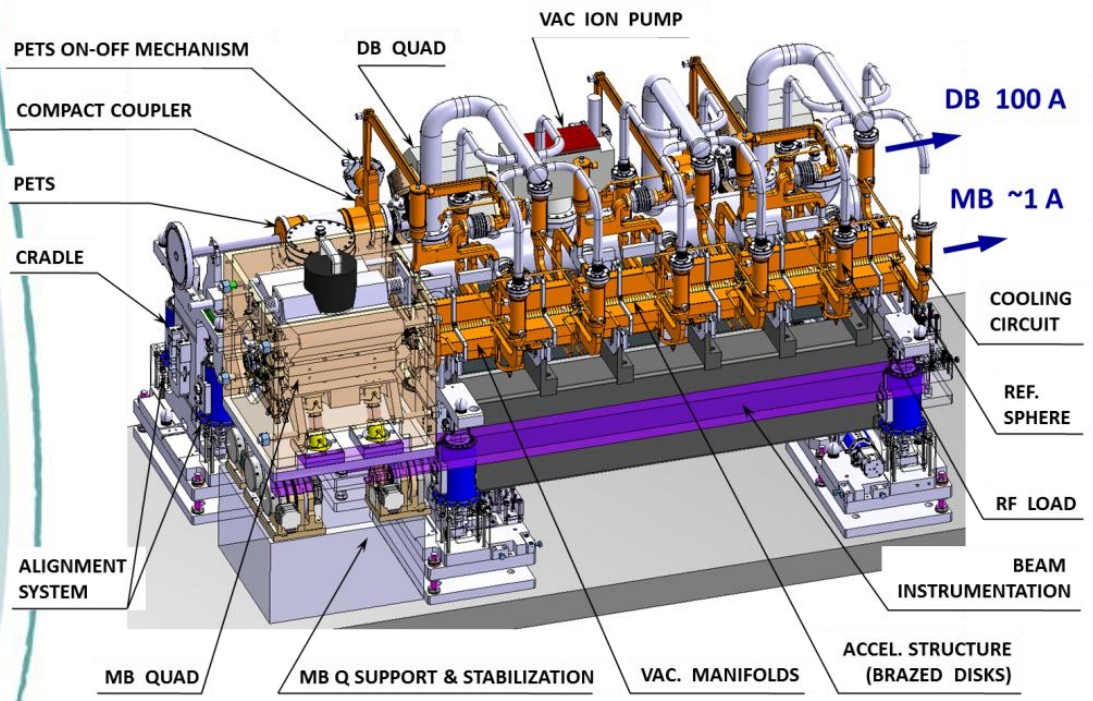
Laboratoire d'Annecy-le-Vieux de Physique des Particules

LINEAR COLLIDER EVENT

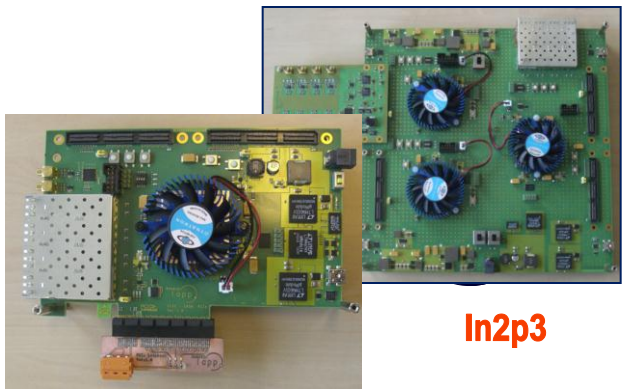
2012 IEEE NSS/MIC/RTSD

Linear Collider Module Control and Stabilization

A. Jeremie



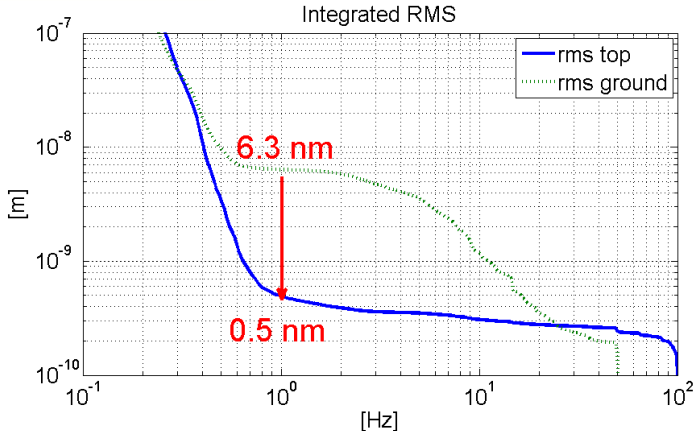
- Lots of channels (~375) for acquisition and control
- Need for a distributed and standardized system
- Evaluation boards very helpful

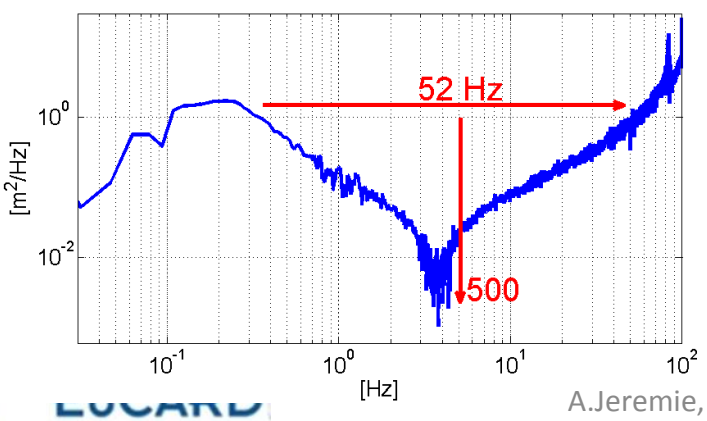


In2p3

Stabilization on Type 1 MBQ

- Water cooling 4 l/min
- With magnetic field on
- With hybrid circuit





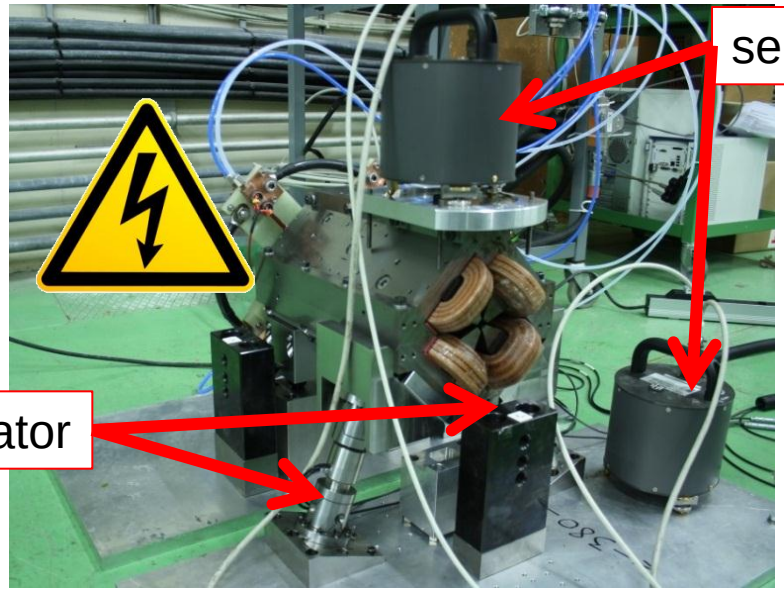
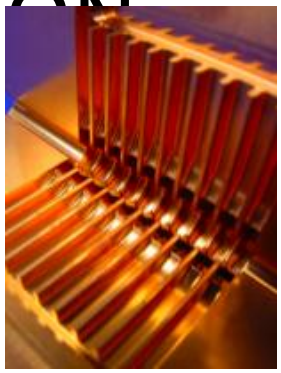


Figure	Value
R.m.s @ 1Hz magnet	**0.5 nm**
R.m.s @ 1Hz ground	6.3 nm
R.m.s. attenuation ratio	**~13**
R.m.s @ 1Hz objective	**1.5 nm**

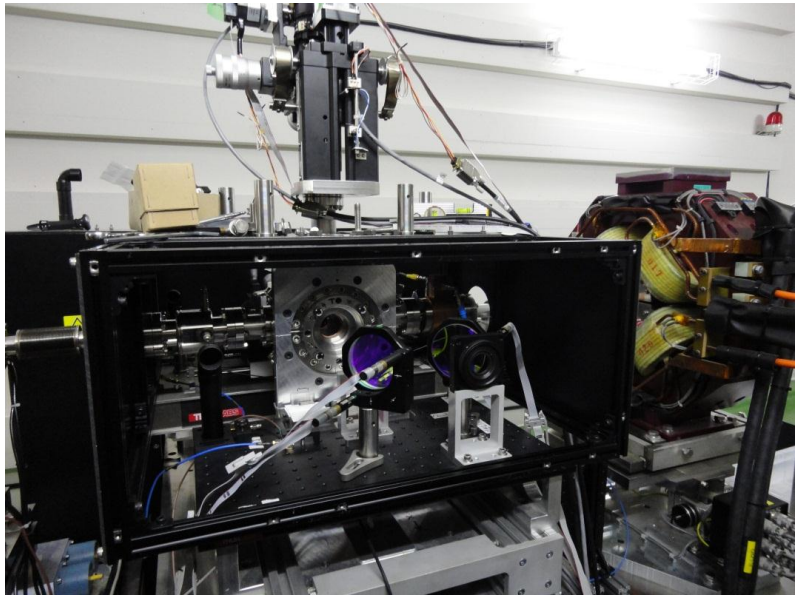
Institute of Electrical and Electronics Engineers
2012 IEEE NSS/MIC/RTSD Anaheim, California
27 October - 3 November 2012

LINEAR COLLIDER BEAM INSTRUMENTATION



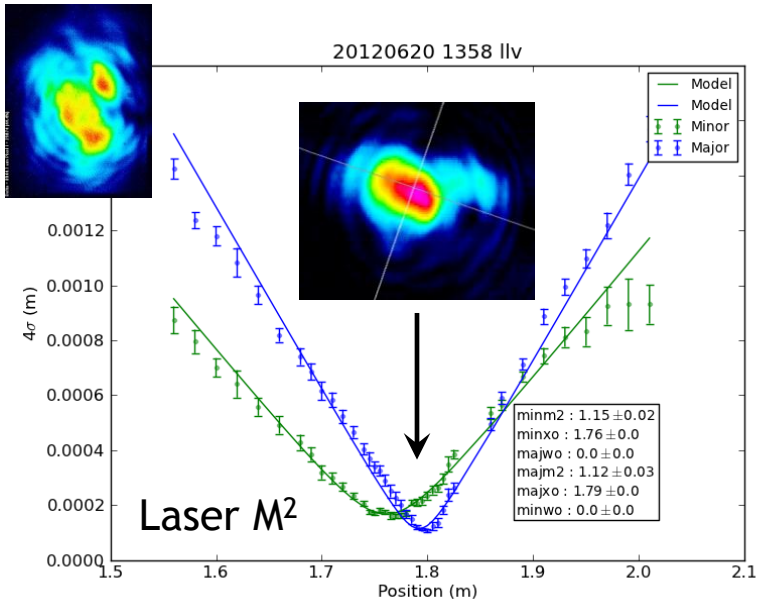
T. LEFEVRE, CERN
ON THE BEHALF OF THE LC BEAM INSTRUMENTATION COMMUNITY

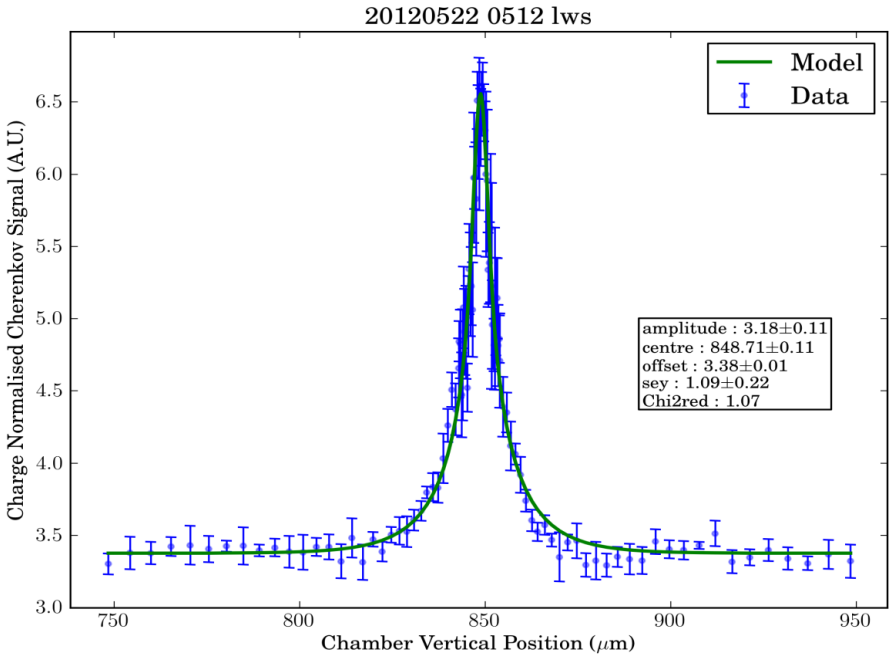
Laser Wire Scanners



ATF2 Laser-wire @ KEK in 2012

- LW moved during 2011 shutdown
- e^- optics V:1μm x H:200μm
- Lower background
- Laser focus characterised in depth
- Further analysis on-going

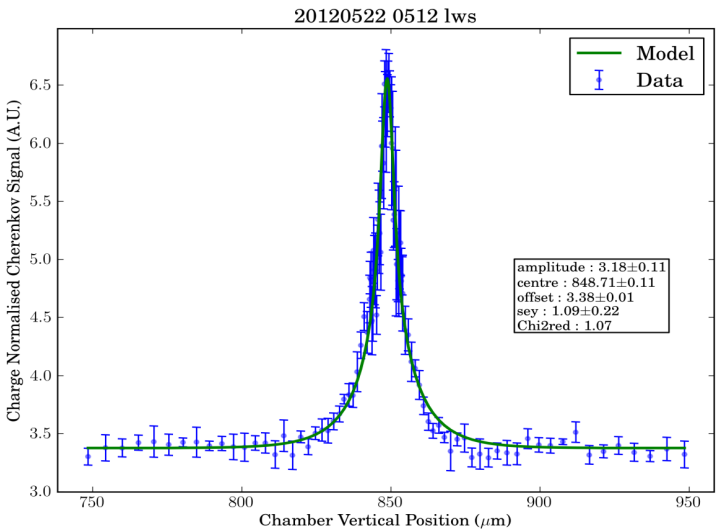


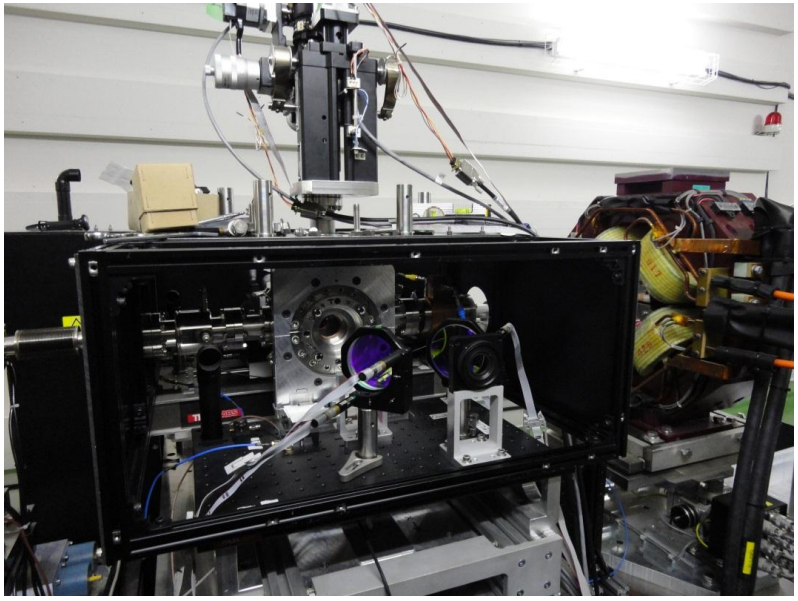


L. Nevay, L. Corner, S. Boogert, P. Karataev, A. Aryshev

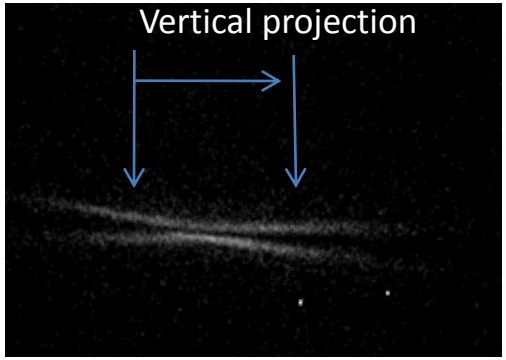
High resolution beam size measurements

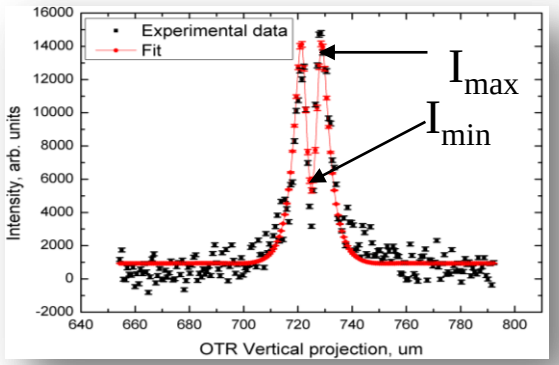
Laser-wire scanner @ ATF2

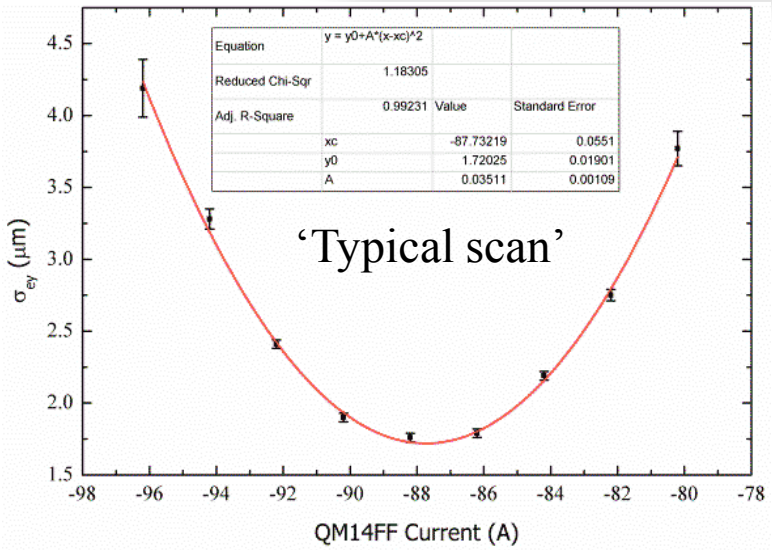




OTR imaging @ ATF2







Alignment challenges for a future linear collider

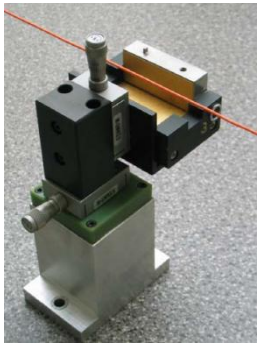
H. MAINAUD DURAND

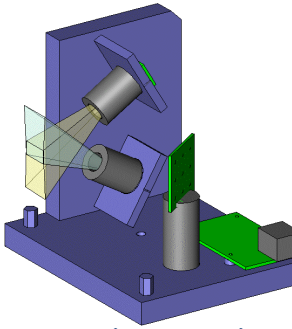
Stretched wire

- Long range alignment system

Capacitive based WPS (cWPS)

- Short range alignment system





Optical based WPS (oWPS)

- Micrometric fiducialisation

MPE = 0.3 μm + L/1000 (L in mm)

Micro triangulation

Summary of the
Machine Protection Workshop
6-8 June 2012 @ CERN

main focus: linear accelerator complexes

Wednesday (experience and future needs)

- **Machine protection and operational availability, issues and solutions.**
- **Beam loss mechanisms**.

Thursday (instrumentation and technology)

- **Failure onset detection.**
- **Failure mitigation.**

Friday

- **Operational aspects** (commissioning, intensity ramp, machine availability)
- **Risk assessment**: management and tools
- **Summing up and conclusions**

Workshop Website http://indico.cern.ch/conferenceDisplay.py?confId=185561

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