CLIC-ILC BDS & MDI work

Materials for discussion

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for CLIC team
Andrei Seryi
for ILC BDS team

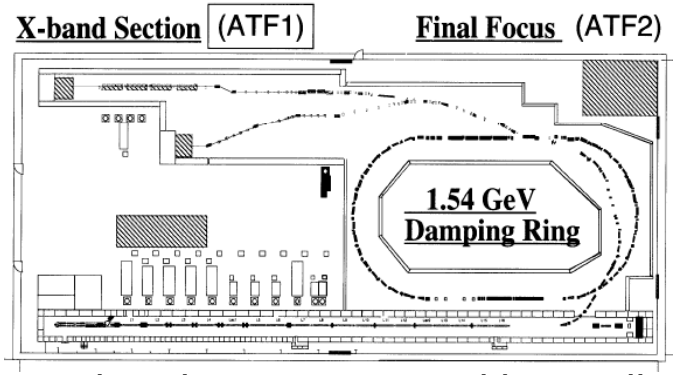
February 8, 2008

Strategy

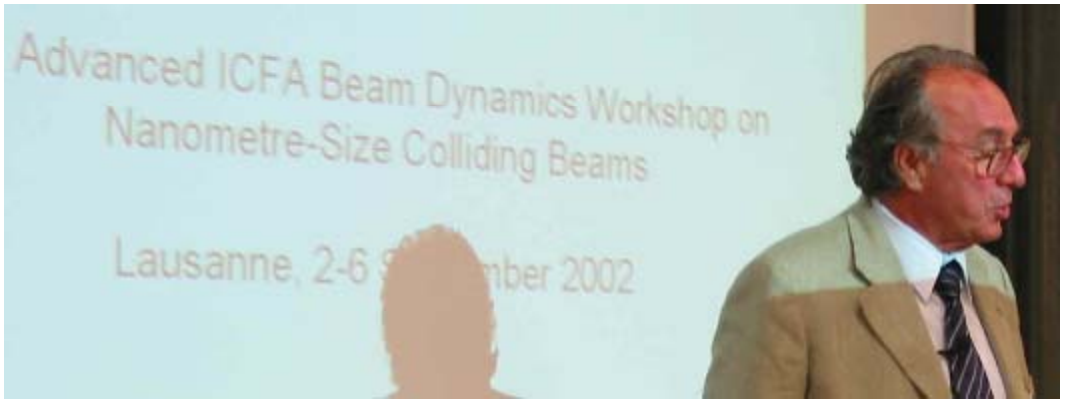
- Looking forward to work with CERN and CLIC colleagues
- Consider this as a natural continuation of long and fruitful collaboration
- Expect that challenging scientific tasks will benefit ILC and CLIC research, and both short and long term program of involved institutions
- Expect that ideas and solution would have broad applicability and we will be proactive in search of such opportunities

Fruitful history => future

- ATF2, a prototype of advanced final focus for linear collider, was conceived at Nanobeam 2002, organized by CERN
- Idea evolved, and now being realized in iron and concrete
- Now looking forward to work with CERN colleagues on experiments at this facility



Early scheme presented by Junji



L.Maiani

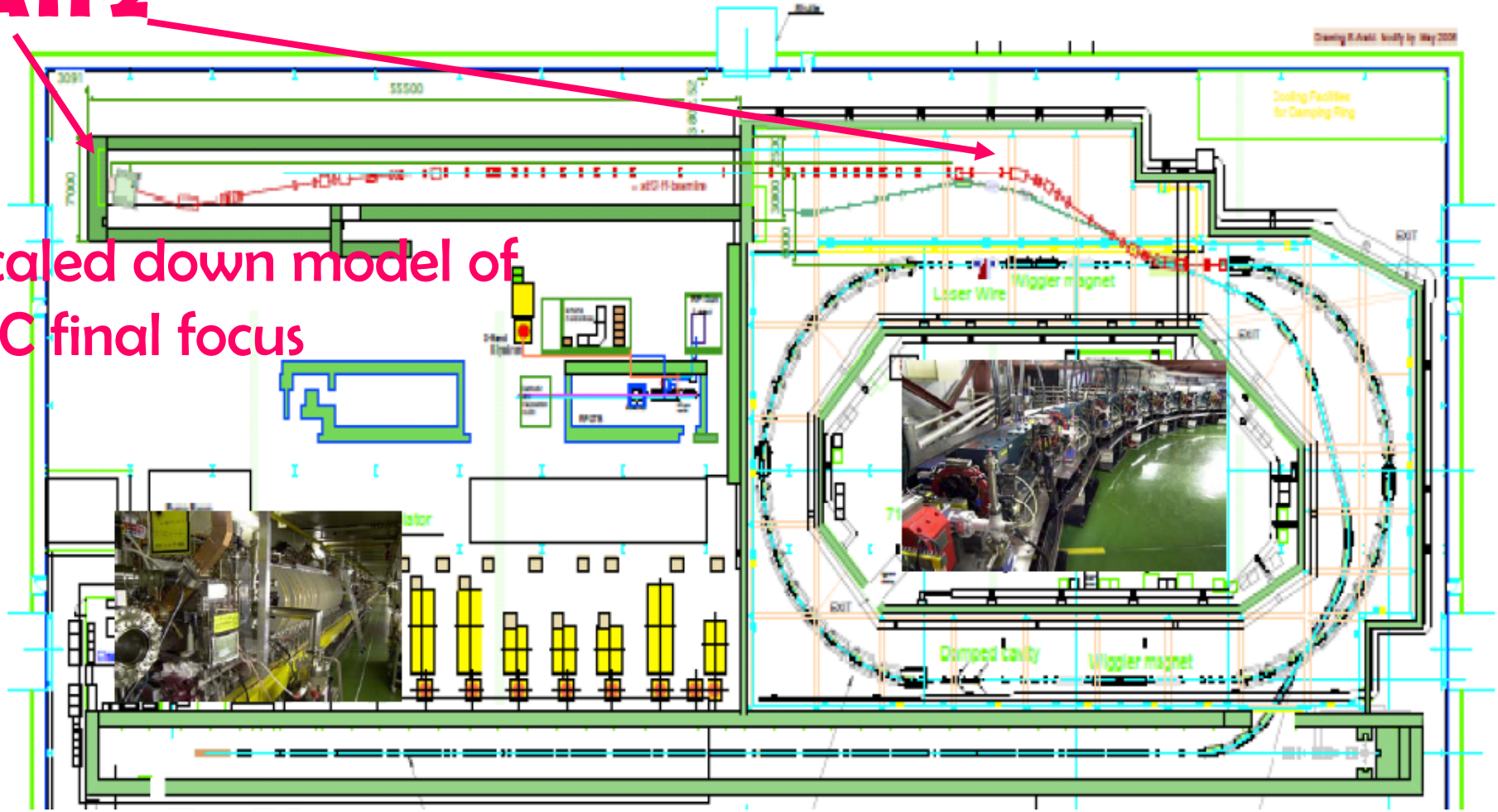
R.Assmann, F.Zimmermann

J.Urakawa

ATF
Accelerator Test Facility
at KEK

ATF2

Scaled down model of ILC final focus

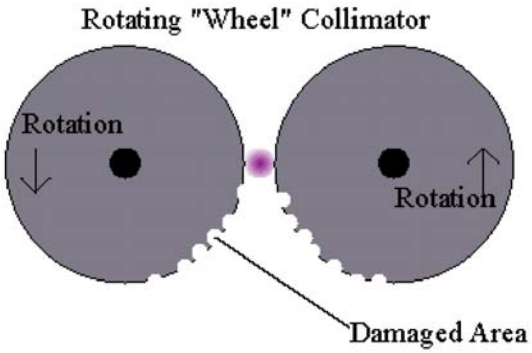


The ATF international collaboration include more than 200 researchers and the ATF MOU is signed by 20 institutions from all over the world

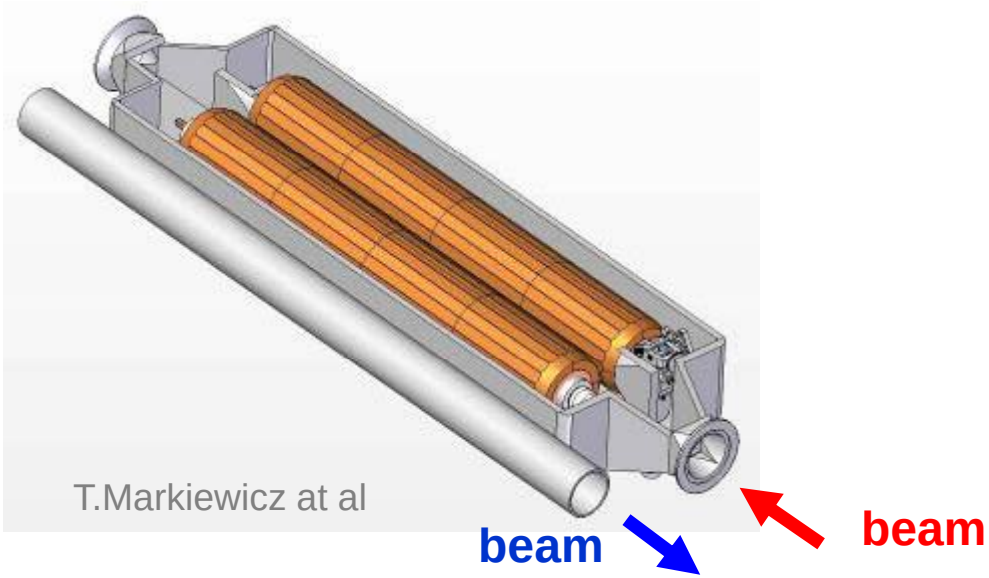
ATF2 construction – January 2008

The last regular quadrupole is going to the destination

Collimation



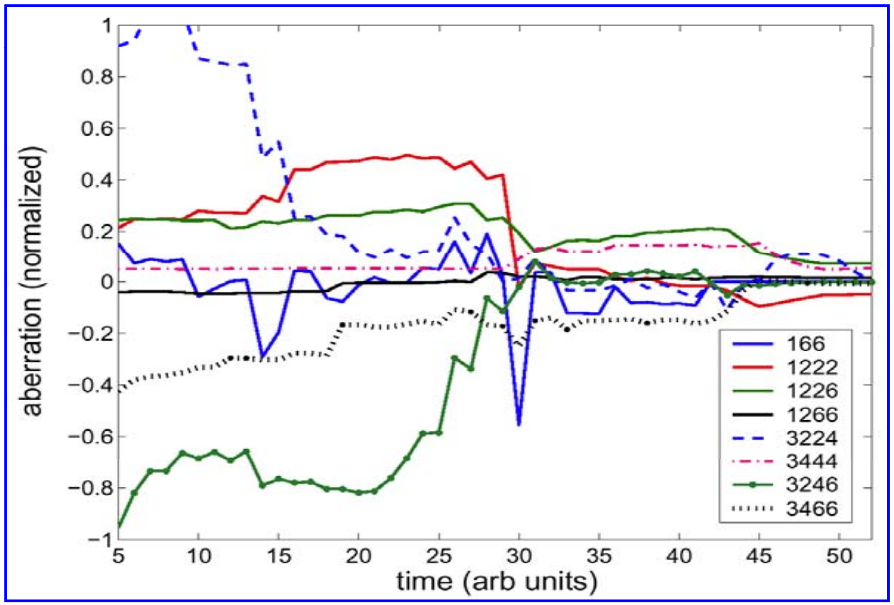
- Consumable collimators developed for NLC
- Concept applied for LHC phase II collimation



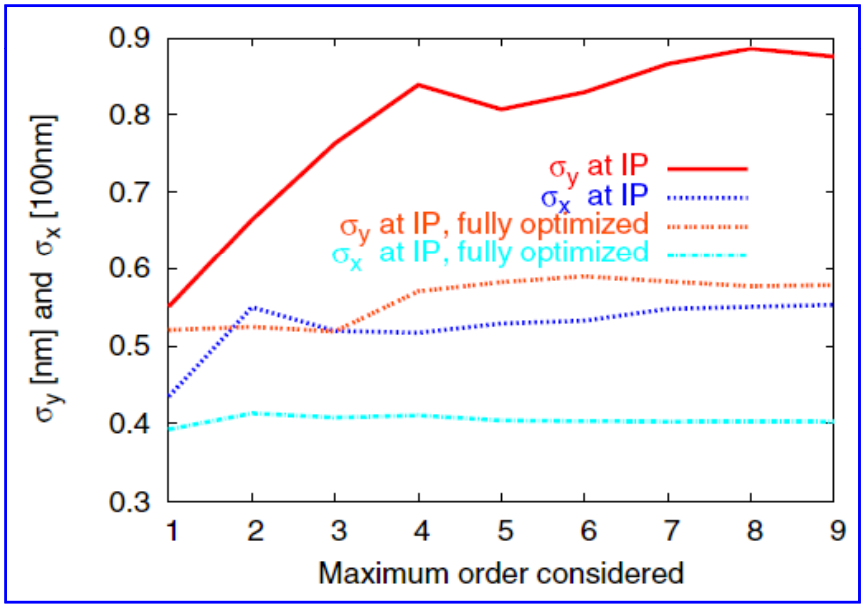
- Will be studied for CLIC

Optics optimization

- Tools developed for optimization of beam delivery will be mutually used for further improvement of the designs



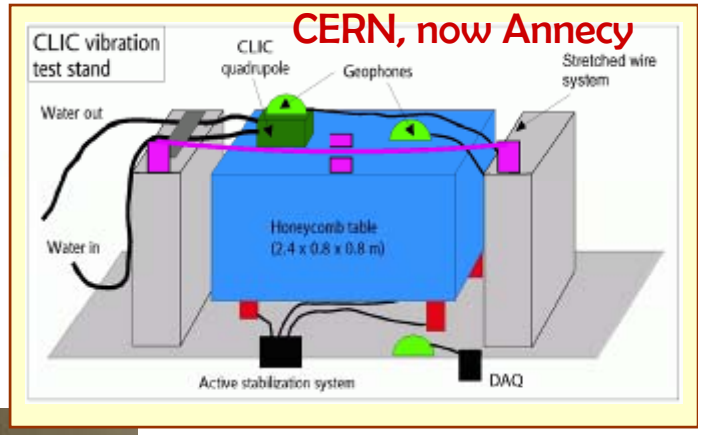
ILC BDS optimization

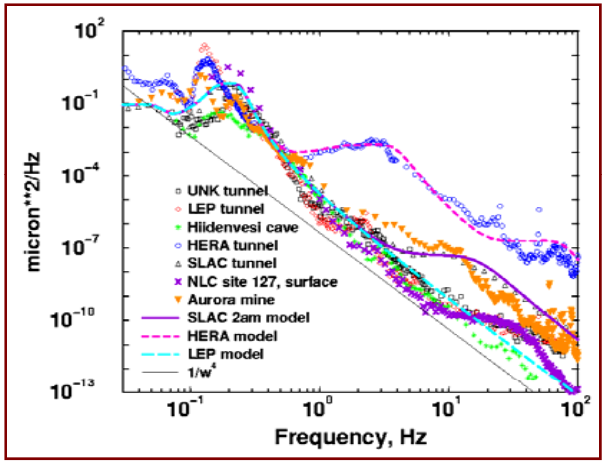


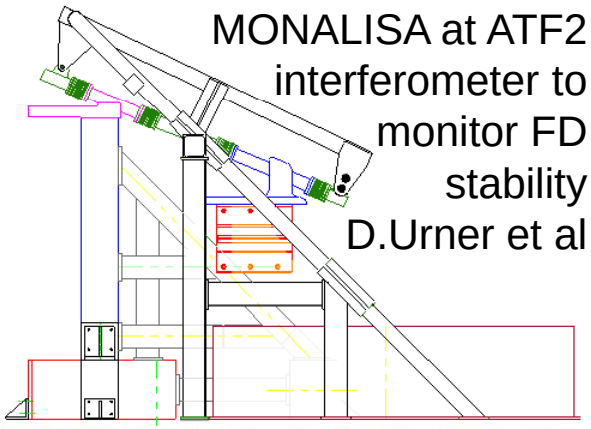
R.Tomas, CLIC BDS optimization

Stability

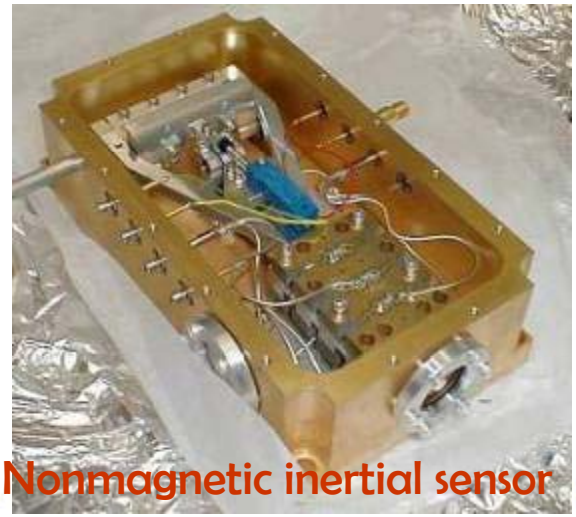
- Long history & potential for future joint developments





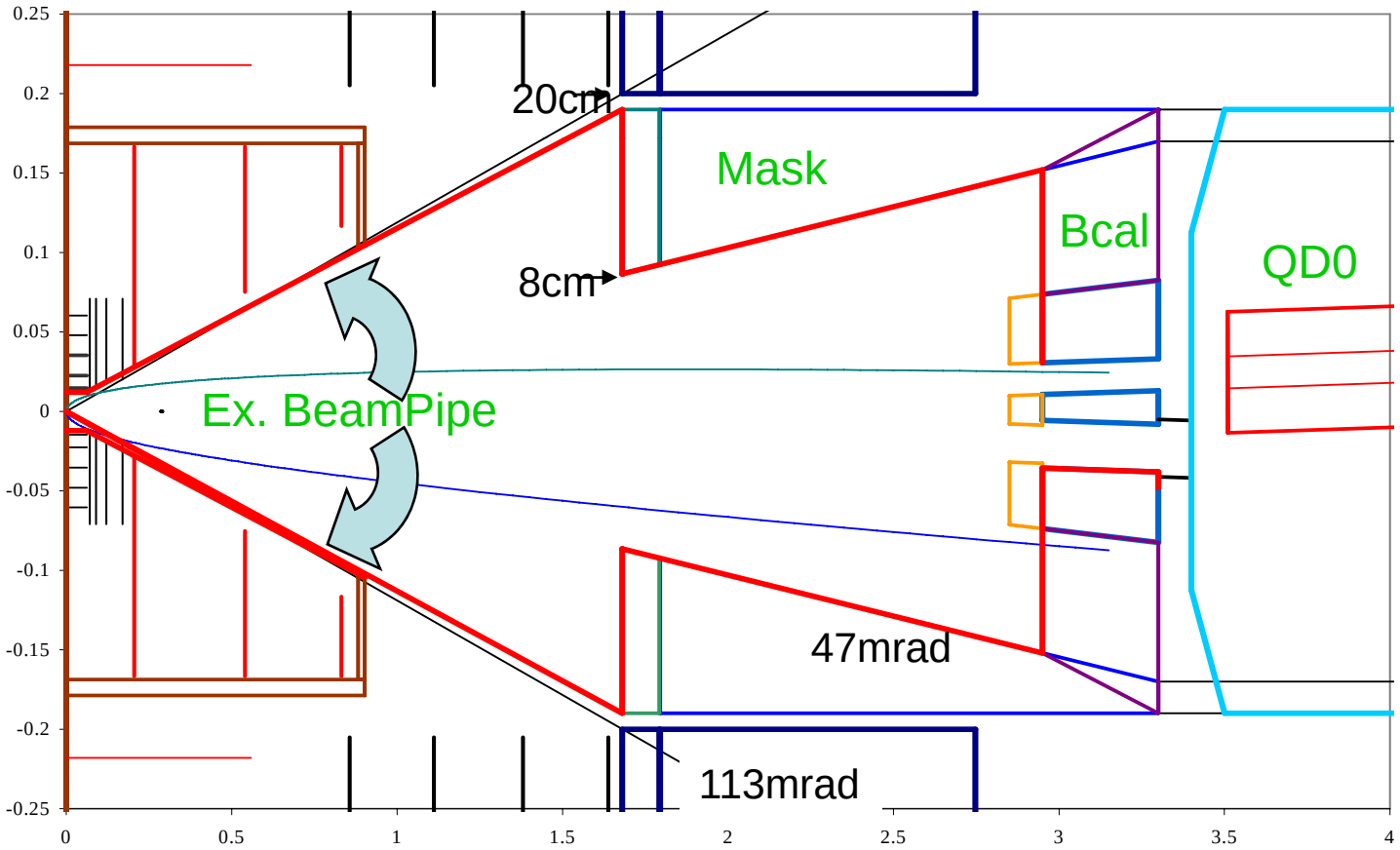


MONALISA at ATF2 interferometer to monitor FD stability
D.Urner et al

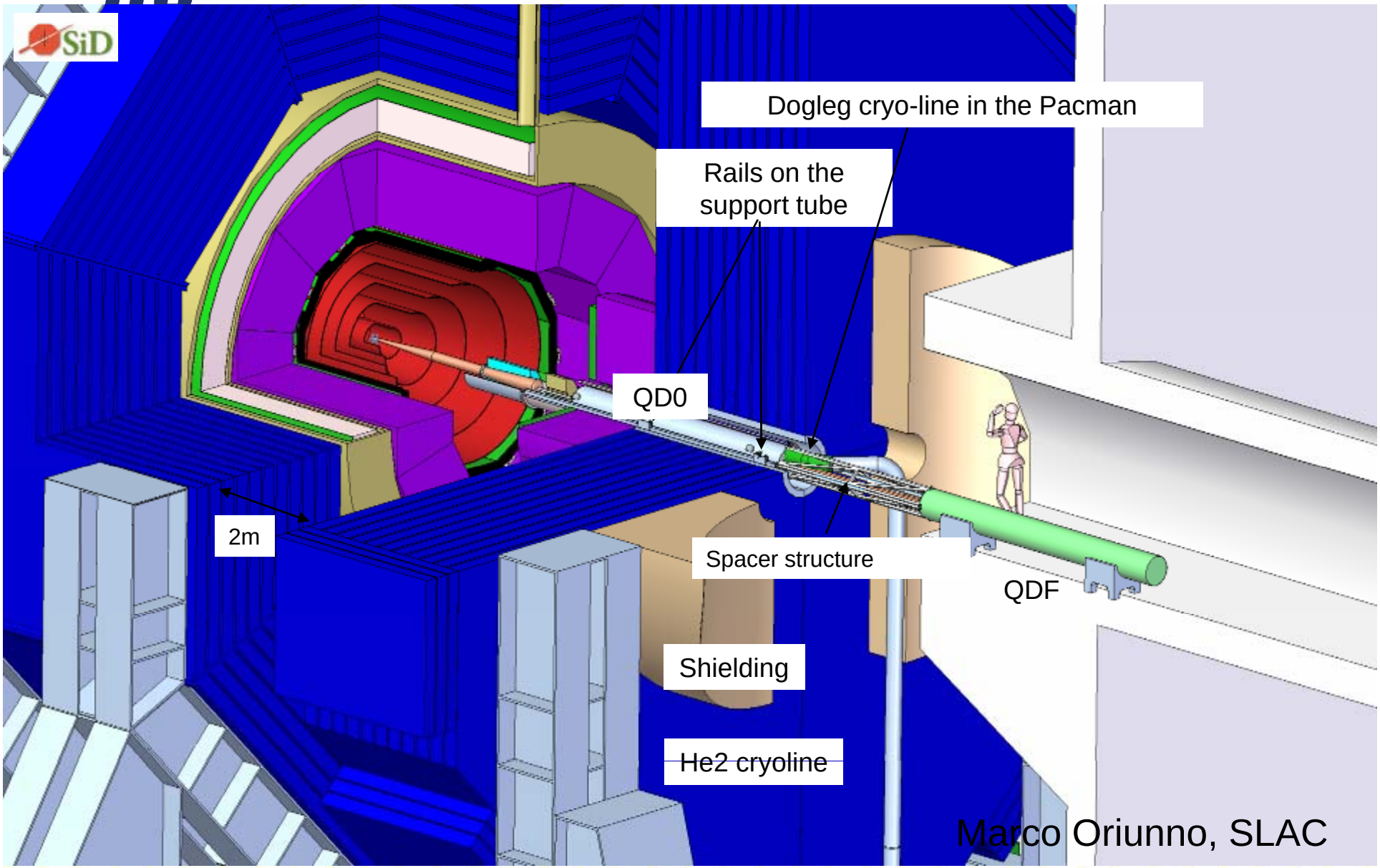


IR integration (or MDI)

- Variety of common interest tasks
- Focus of joint activity

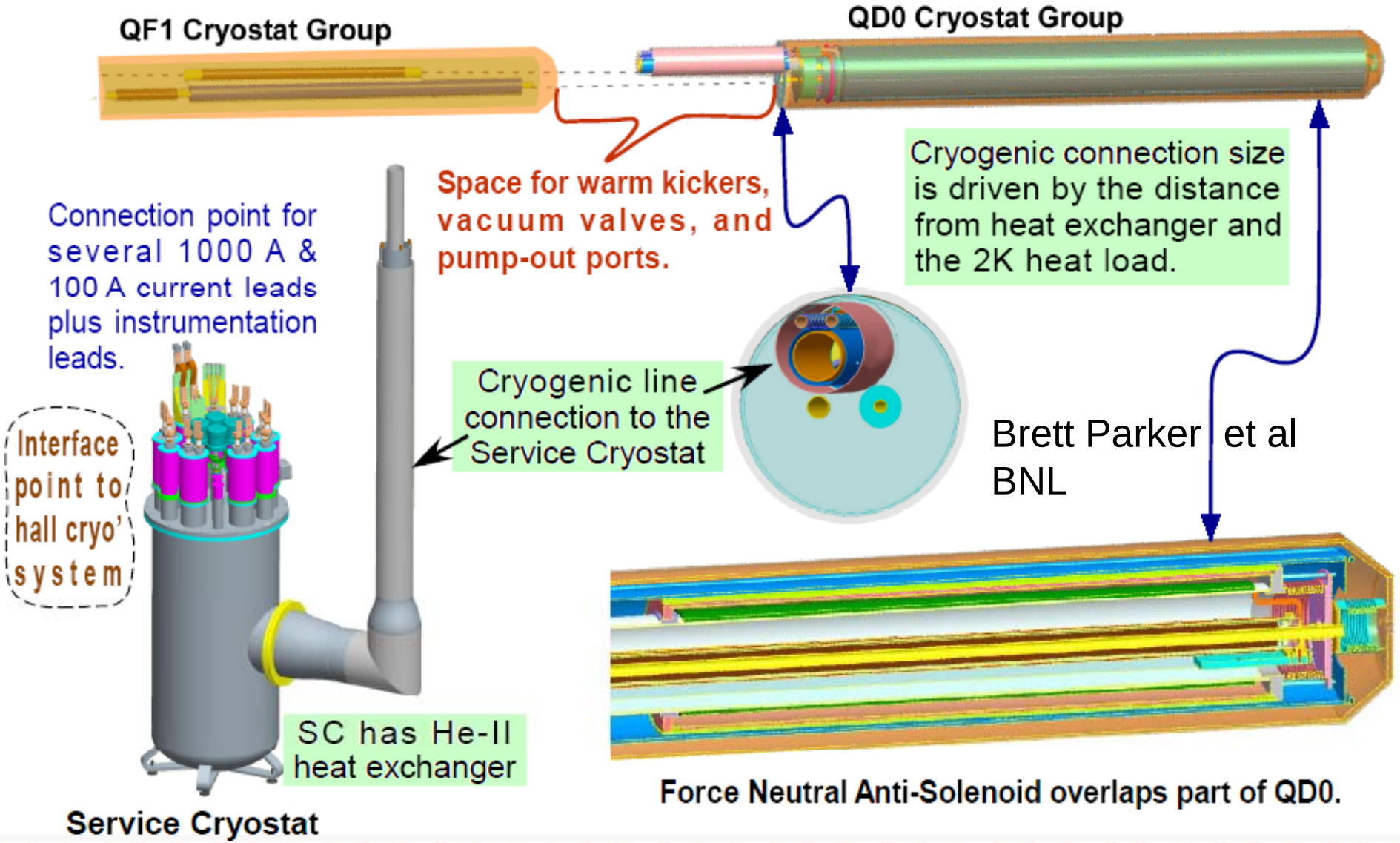


IR integration, SiD example

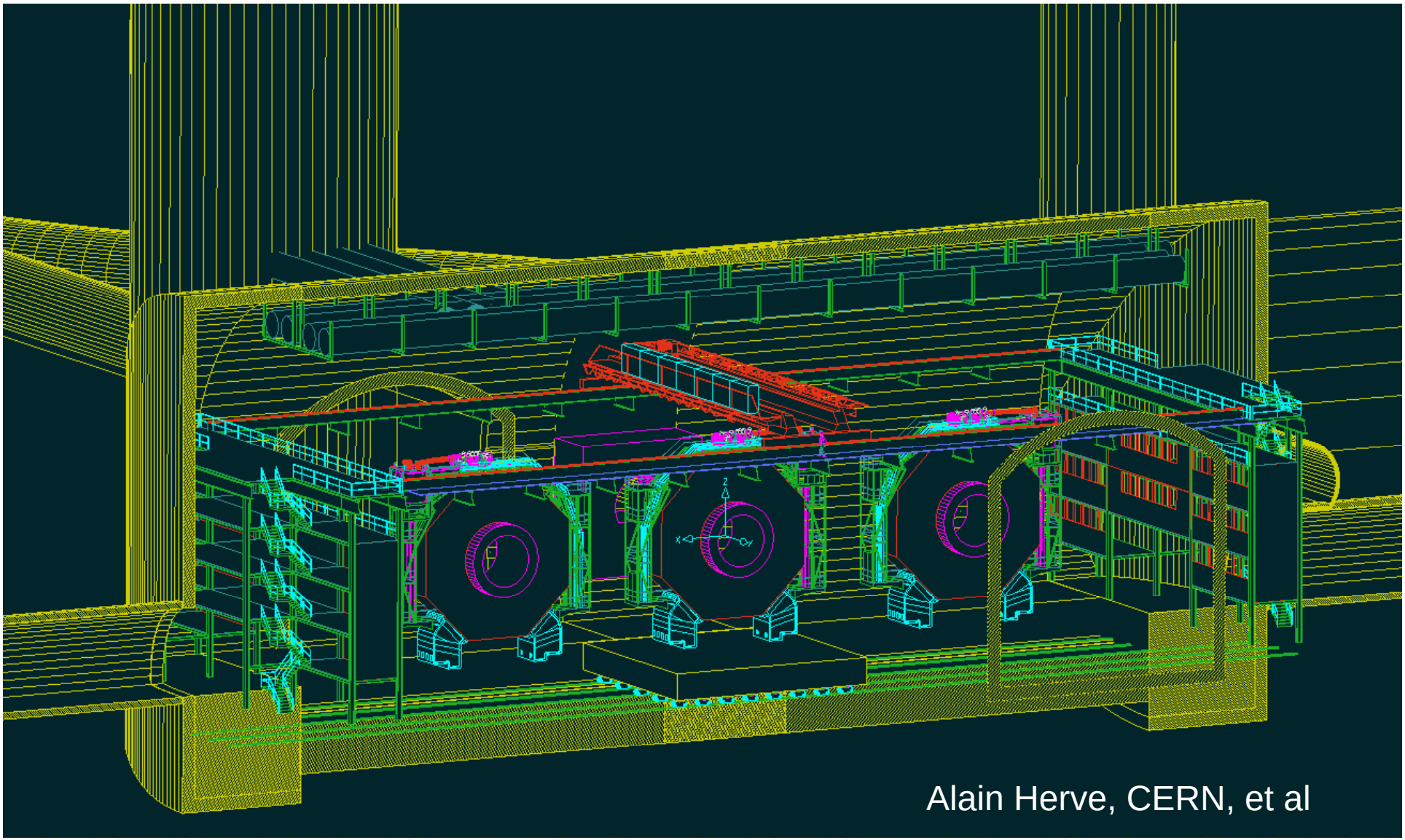


Marco Oriunno, SLAC

SC final double & its stability study



Push-Pull studies for two detectors



Detailed lists of tasks

- In preparation for CLIC-ILC meeting on February 8, a phone meeting was held on January 28. Participants: Andrei Seryi, representing GDE BDS & MDI, and Daniel Schulte, Rogelio Tomas, Emmanuel Tsesmelis and Andrea Latina (CLIC) , representing CLIC BDS&MDI efforts

- Second preparatory phone meeting, Feb 5. Participants: Daniel Schulte, Rogelio Tomas, Emmanuel Tsesmelis and Andrea Latina for CLIC, and Andrei Seryi, Brett Parker, Tom Markiewicz and Deepa Angal-Kalinin for GDE BDS & MDI

- Lists being developed (see next pages)

- Next milestones
  - **Identify contact persons for different tasks**
  - **Identify solutions for LHC that can be applied to ILC and CLIC**
  - **Identify solutions for ILC that can be applied to CLIC**

Detailed lists being developed…

- Optics design and optimization
- Collimation system
- Final focus system
- Extraction line
- Design concepts
- Optmisation tools
- Tracking tools
- Collimators
- Survival
- Wakefields
- ATF2
- Tuning procedures
- Flight simulator
- Energy spectrometer
- Polarimeter
- Beam dump

- Crab cavity
- Design
- Phase stability
- Beam instrumentation
- BPMs
- Laser wires
- Extraction line instrumentation
- Feedback design
- Beam-based alignment and tuning procedures
- Survey
- Stabilisation
- Magnets and power supplies
- Final doublet design
- Intra-pulse IP feedback
- BPM for intra-pulse feedback
- Integration of corrector kicker
- Feedback design

Detailed lists being developed…

- Background studies
- Common simulation tools
- BDSIM
- Integration into GEANT?
- FLUKA
- Halo and tail generation
- Common formats etc
- Study of machine induced background
- In particular, neutrons, muons and synchrotron radiation
- Mitigation strategies
- e.g. tunnel fillers against muons
- Study of beam-beam background and luminosity spectrum
- Support and stabilization
- Low-noise design
- Noise level measurements
- Among others, measurements at LHC
- Component design
- Mechanical design of quadrupole support
- Stabilization feedback design
- Sensors
- Actuators
- Inner/forward detector design
- General layout and integration
- Masking system
- Constraints on vertex detector
- Common tools for detector studies
- Low angle calorimeter
- Beam pipe design
- Vacuum etc.
- Crossing angle
- Try to find a common crossing angle
- Experimental area integration (to be done with other groups)
- Infra-structure
- Push-pull