
Example of international collaboration

LLRF Workshop 2007 Knoxville, TN

Outline suggested by Shin Michizono

- - LLRF Telephone conference meeting
- - FNAL/DESY collaboration
 - example: FNAL's experiments at FLASH
- What did you plan (for example this summer)?
- What could you do during your stay at DESY?
 - example: DESY's equipment at FNAL
- What is the aim?
- - from the basis of your FNAL/DESY collaboration, how can we do the international collaboration for LLRF?
- I hope this topic includes lesson learned from your collaboration experience.

LLRF teleconference

- Hosted by Fermilab on Tuesdays 9am (CDT).
 - Started as an offspring of the LLRF workshop of February 2006 at Fermilab, with the idea of keeping people in contact.
 - Collaborators:
 - DESY
 - KEK
 - LBNL
 - JLAB
 - ANL
 - SLAC
 - UPENN
 - U. of Pisa
 - Fermilab (AD, TD, CD)
 - Some collaborators have been participating often, others occasionally.

LLRF teleconference

- This meeting was used in two different ways:
 - For direct collaboration: to discuss projects where 2 or more labs were actively involved.
 - E.g. FNAL groups using, modifying existing DESY hardware, firmware and software such as Simcon3.1, DOOCS.
 - The UPENN cavity simulator.
 - Mechanical studies for piezo-control.
 - As an informal forum to present interesting studies and LLRF designs.
 - E.g. LLRF components and design strategies (methods, analog and mix-AD hardware, firmware and software) from DESY, KEK, LBNL, FNAL, UPENN, Pisa, etc.
 - Cavity and cryomodule measurements.

LLRF teleconference

- Comments:
 - Very positive experience, we should keep this meeting going.
 - It takes some good effort from the host in planning, communicating with the groups, suggesting topics for the agenda; and effort from presenters to come up with good material.
 - The meeting did not have a strategic plan or schedule towards achieving milestones of a particular project.
 - This is a point for consideration. It is our choice to make it project oriented or not.
 - Webex facilitated document sharing on the spot. We all got used to Webex very easily.

FNAL/DESY collaboration (as example)

- Helen Edwards (FNAL) has held a long term collaboration (1996) between DESY and the FNAL. Photo-injector group.
- DESY's LLRF systems were used to control the RFGun, CCI and CCII at FNAL Meson lab.
- DESY and FNAL people traveled and worked together in these projects.
 - The collaboration was essential to bring the less experienced groups up to speed in these projects.
 - After some time the collaboration really started working in both directions. And we are putting effort in keeping it that way.

September 07 tests at DESY-FLASH

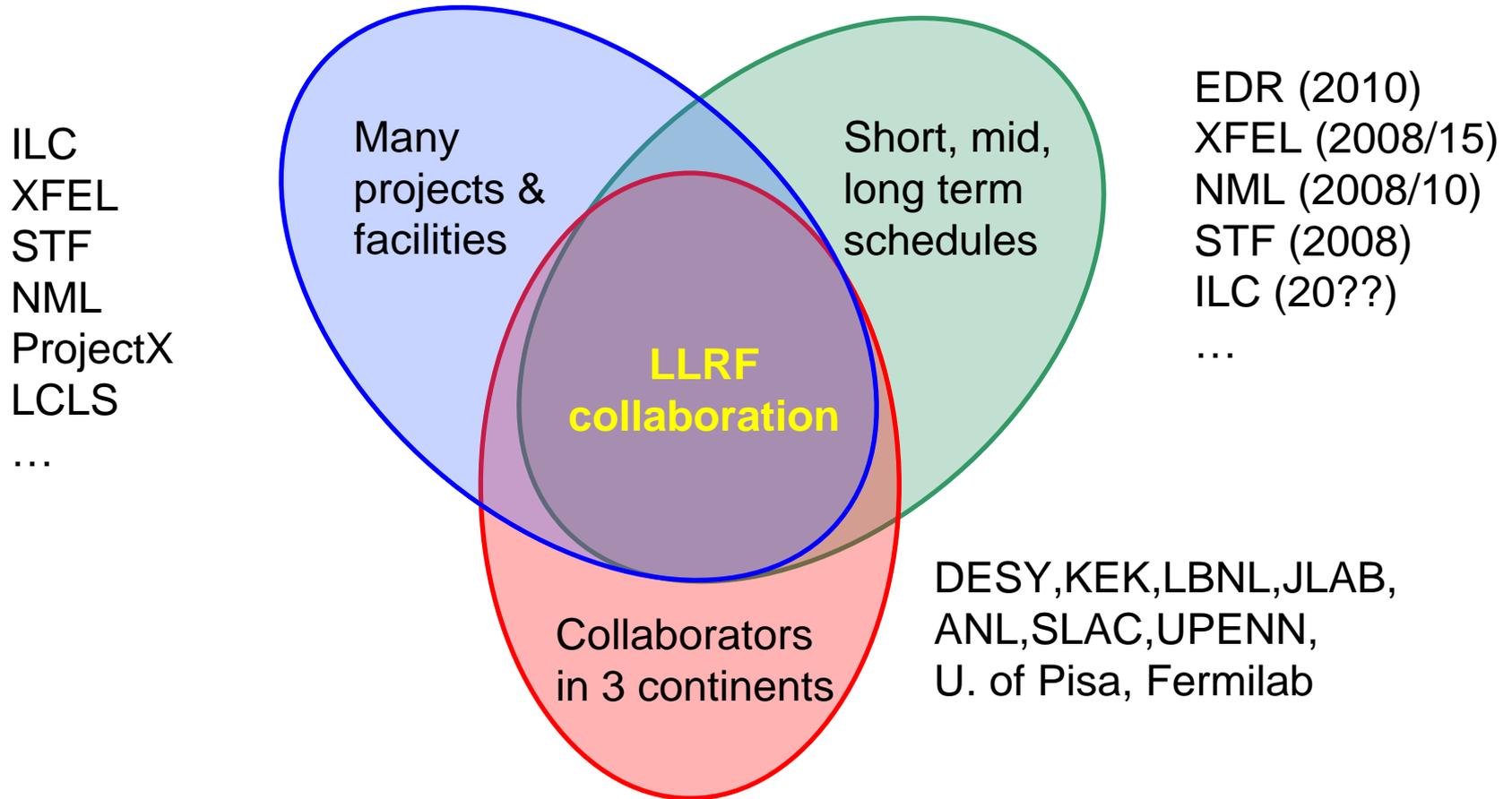
- FNAL group of 5 people from 3 different departments traveled to DESY.
 - Four pieces of hardware designed at FNAL: LO generator, multi-channel up/down converter, MO box, Linux processor.
 - 10 channel ESECON controller with new firmware.
 - Linux processor running Matlab applications.
 - We did not have time to test the integrated system at FNAL before the trip. Big time opportunity for showstoppers.
 - Integration at DESY was laborious but successful.
 - We run a cryomodule closed loop, calibrated our inputs and outputs, measure noise.
 - Good DESY support from different groups.
 - LLRF, networking, FLASH operations.

September 07 tests at DESY-FLASH

- Comments:
- This time the level of involvement of DESY-LLRF in FNAL tests was low, as agreed before, and vice versa because everybody were busy with their own tests or at a conference in Poland. The collaboration in future tests can be planned different if required or desired.
- The trip was also a good opportunity to discuss LLRF problems and goals.

From the basis of your FNAL/DESY collaboration, how can we do the international collaboration for LLRF?

- Complex puzzle



International Collaboration

- Q: International collaboration for the ILC or a more general collaboration to help multiple projects?
- Choose a collaboration style:
 - Loose collaboration: for instance this workshop, point to point collaborations between groups/labs.
 - Tight collaboration: project management structure.
- The collaboration should focus on addressing the current unknowns in LLRF. This effort should be lined up to the risk mitigation goal for the ILC-EDR. For instance:
 - Machine and beam parameters -> LLRF design.
 - Disturbances.
 - High availability.
 - LLRF automation.
 - Operations.
 - Beam stability in damping rings.
 - Malfunctioning. Machine protection.

International Collaboration

- Set common goals and schedule (short specification doc. and/or institutional MOU).
 - Use logistic: meetings, travel.
 - Clearly define deliverables for a project/facility from R&D goals.
- Plan the use of current and future facilities in the goals.
 - The use of facilities should be coordinated in a way that the facility offers a service to the collaboration and the groups involved in a test.
- Divide and assign responsibilities to groups/institutions.
 - Competition is good, collaboration is better.
- Hardware and software projects will necessarily overlap. That is desirable, it give us options. Collaboration of more than one group/institution in a project should also be encouraged.
 - The ILC alone needs LLRF with different specifications in different sections of the machine (BC, MLinac, DRing).
- LLRF is manpower driven (as opposed to M&S driven) and requires experts with strong academic background, we should make sure that we help the groups to get stronger.