Report on Tracking and CO2 Cooling Meetings and Other Business

- Tracking Group Meeting Karlsruhe, June 16-17
- CO2 Cooling Meetings:
  EVO-Meeting with KEK/ILC/Cryo, June 14,
  CERN Meeting, June 20
- News on Test Beam Running Period

Some News

- Ground Breaking Ceremony

  rescheduled for Friday, Nov. 18, 2011 at KEK
  (during the B2GM)

- Contract on Grounding with ITA Zaragoza

  signed between MPI and ITA,
  (financed via CF of DEPFET Collaboration)

- Submission of Clustering ASIC (IBM 90 nm)

  successfully cancelled (saved about 25 T€ from CF)

Tracking Meeting in Karlsruhe

Task:
develop / implement tracking and vertexing algorithms for the Belle II detector within the BASF2 framework

detectors considered: PXD, SVD, CDC

Who:
group members from Europe (Austria, Czech Republic, Germany)

regular meetings (~ 3 per year), chaired by Martin Heck (KA)

Url and presentations for this meeting:

http://kds.kek.jp/confModifSchedule.py?confId=7377

Tracking Meeting in Karlsruhe (cont.)

Tracking finding algorithms:

Conformal mapping (Oksana Brovchenko)

Hough transform (Jan Bauer)

Cellular Automata (Jakob Lettenbichler)

Track Fitting:

GENFIT (being implemented by Moritz Nadler)

[Vertexing:

RAVE (by Wolfgang Waltenberger)]

Tracking Meeting in Karlsruhe (cont.)

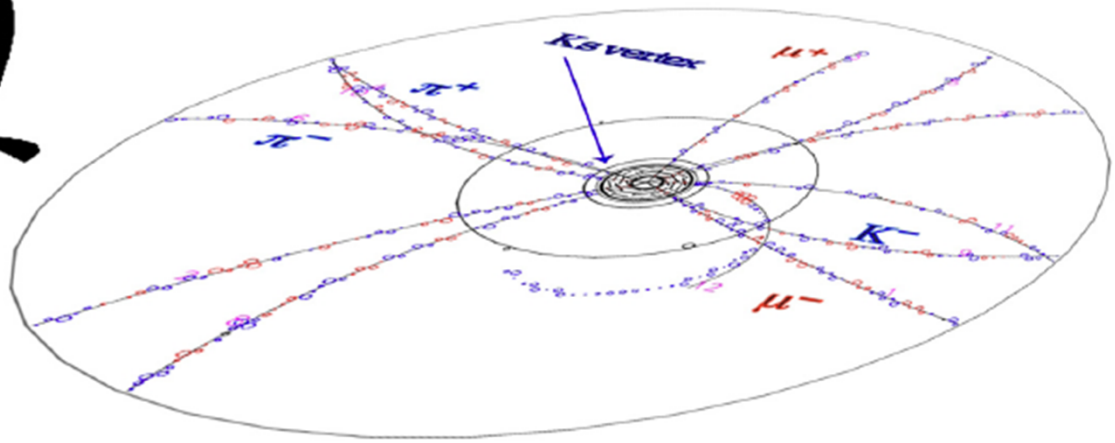
HEPHY Institute of High Energy Physics

ÖAW Österreichische Akademie der Wissenschaften

Low momentum trackfinding in the SVD

Jakob Lettenbichler, Rudolf Frühwirth, Moritz Nadler

Institute of High Energy Physics
Austrian Academy of Sciences
June 16-17th, 2011



Tracking Meeting in Karlsruhe (cont.)

HEPHY Institute of High Energy Physics

What does it look like II

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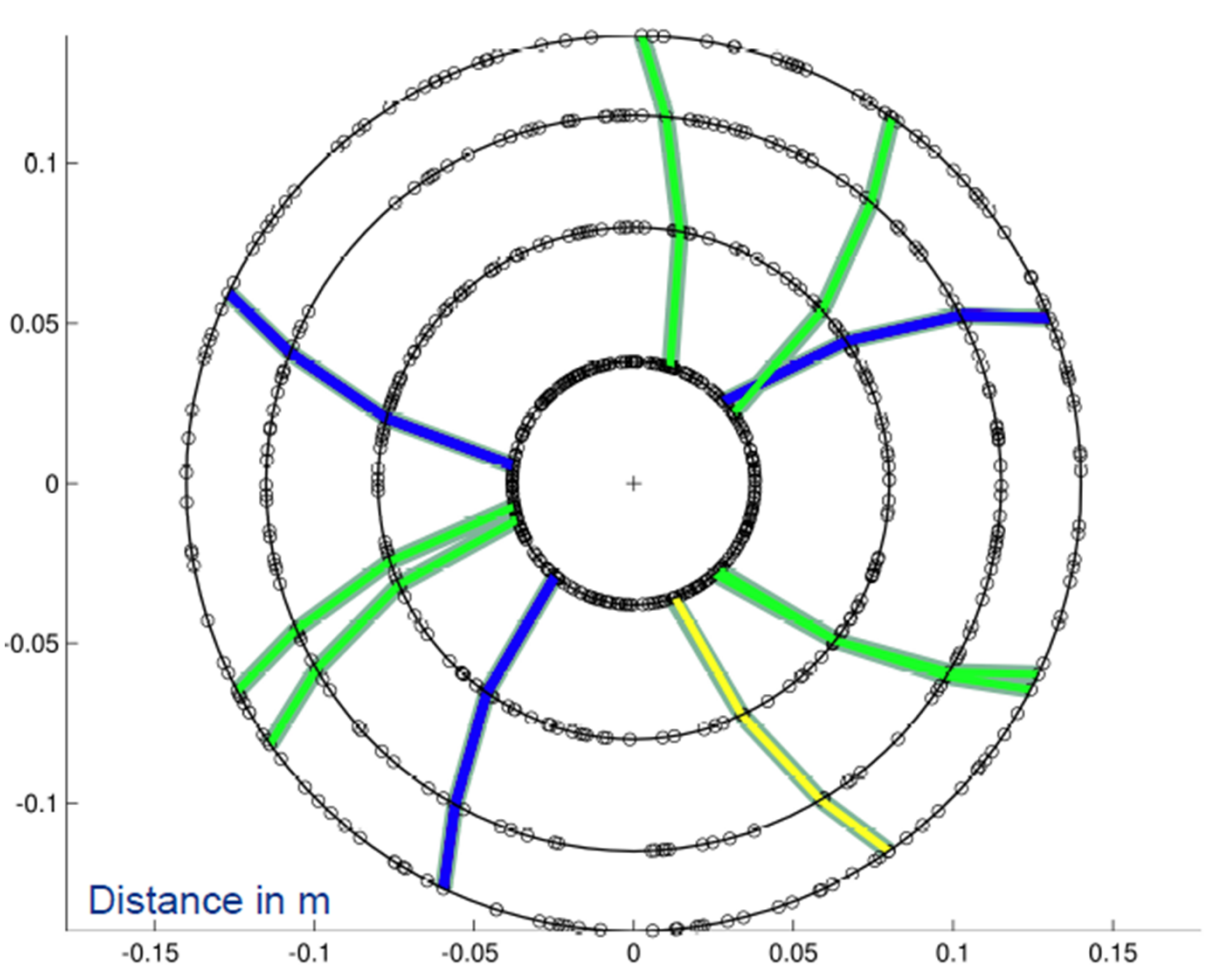
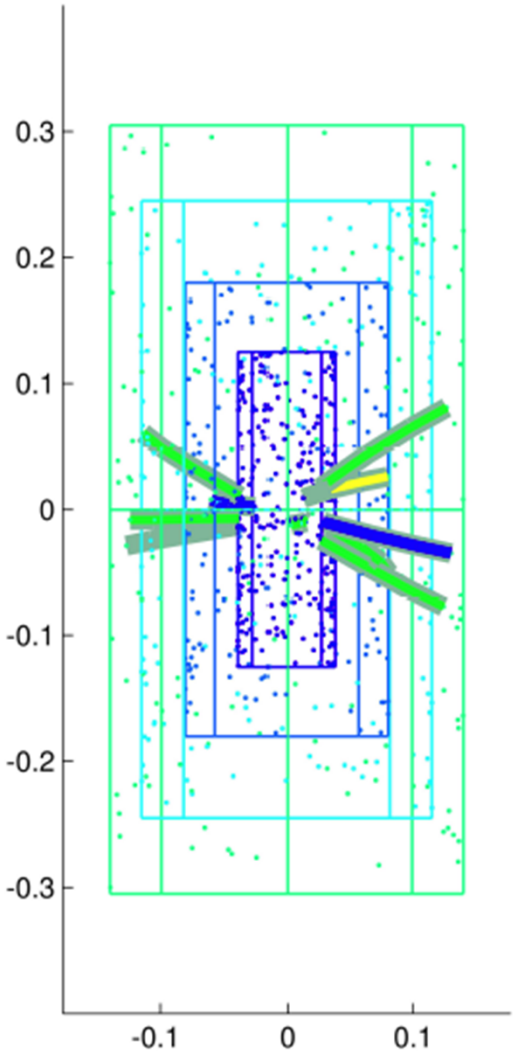


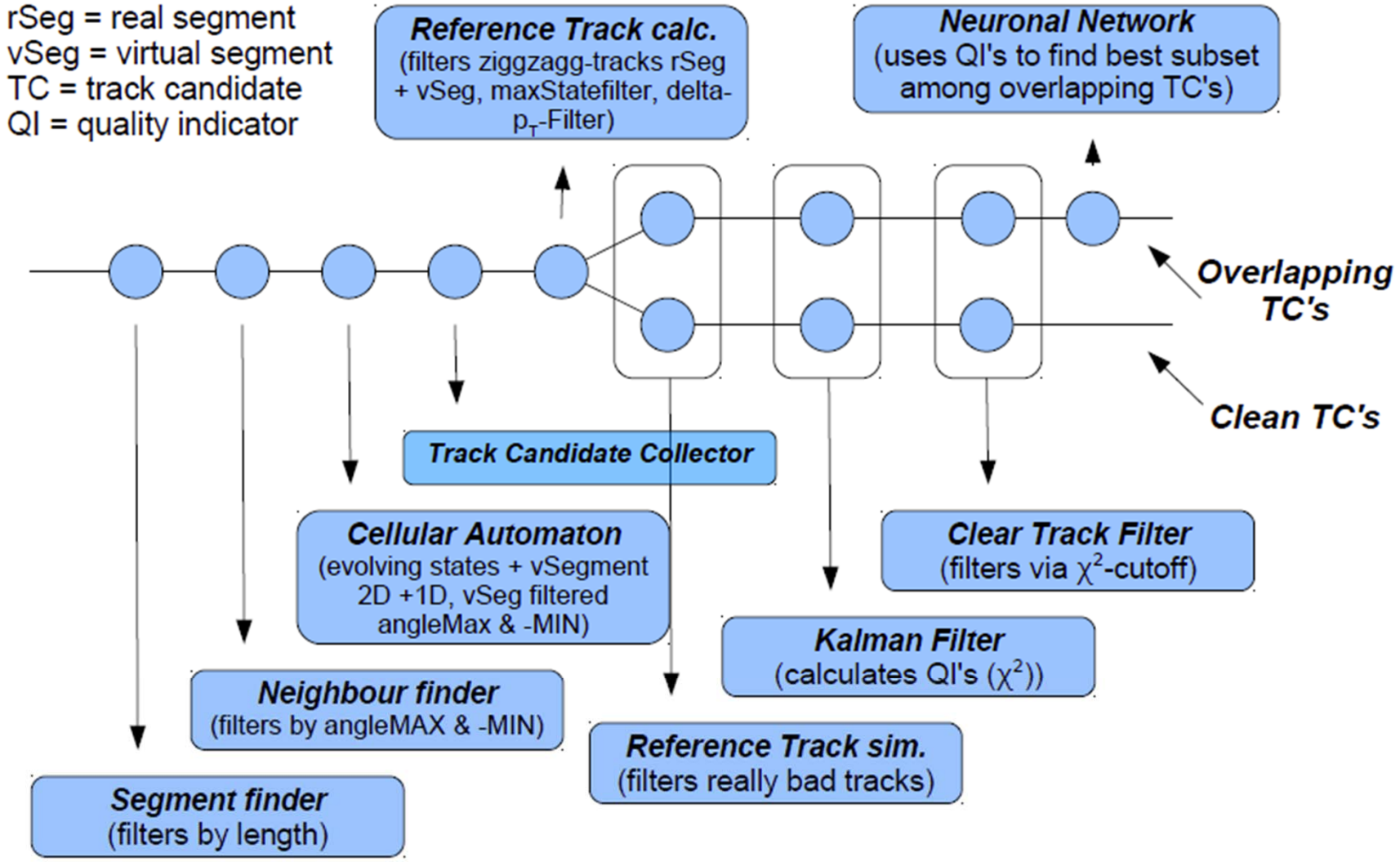


10 Tracks @ p_T=80 MeV/c, worst case version1

F2F Tracking Meeting Lettenbichler, Frühwirth, Nadler 5

Tracking Meeting in Karlsruhe (cont.)

HEPHY Institute of High Energy Physics — Track finder overview



Tracking Meeting in Karlsruhe (cont.)

HEPHY Institute of High Energy Physics

Simulated results II

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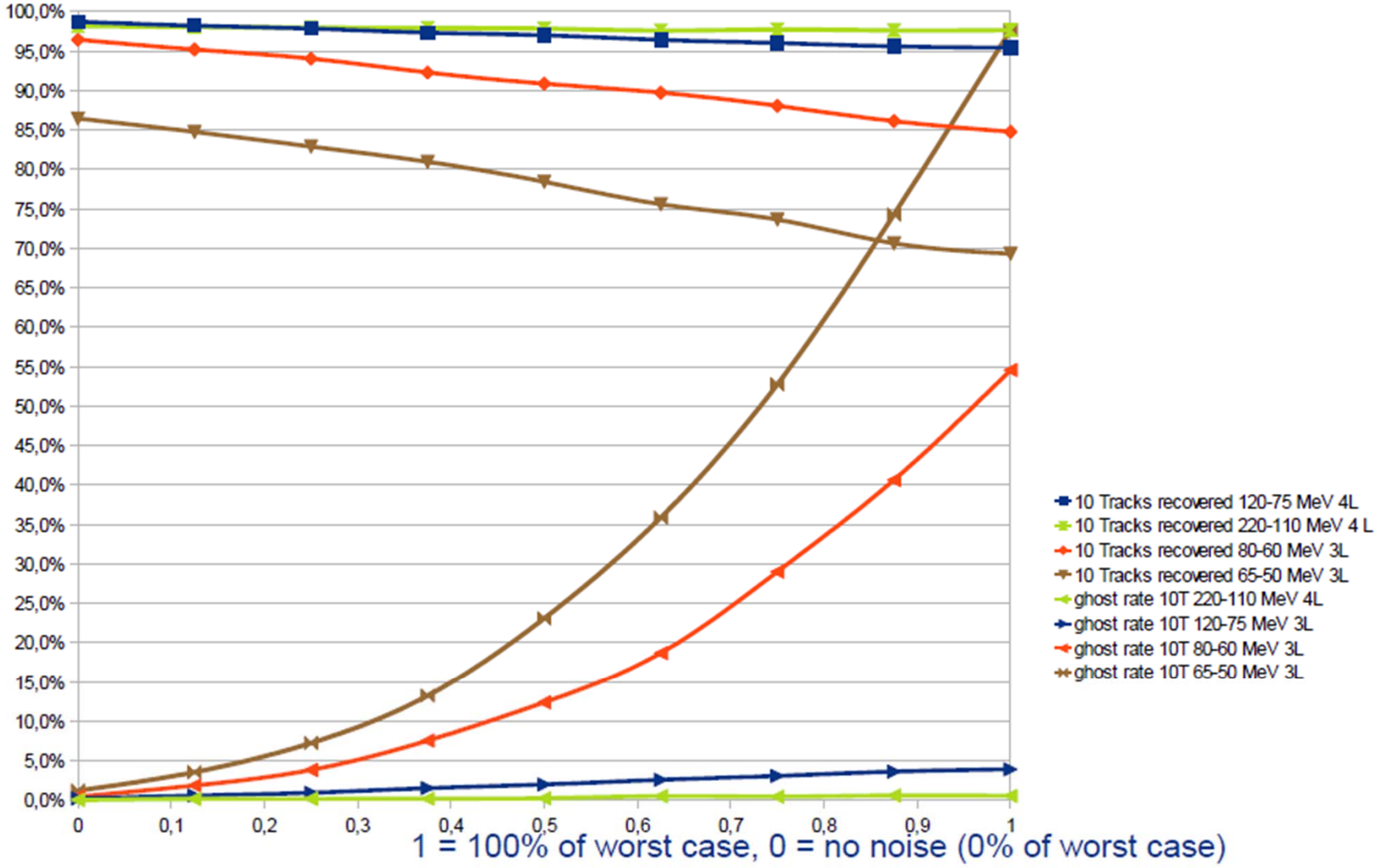


Tracking Meeting in Karlsruhe (cont.)

HEPHY Institute of High Energy Physics · Conclusion for Matlab

Our proof of concept seems to work:

- SVD-only trackfinding is possible
- No real problems with tracks having more than p_T=75 MeV/c and 4 layers - even in worst case.
- Trackfinder without KF+NN gets even higher recovery rate, but paid with a higher ghost track rate (but low enough to be no problem for data reduction techniques)

BUT:

- Problematic results (high ghost rate) at lowest momenta (p_T=50-75 MeV/c) – more filters and fine tuning needed (especially for the offline version).
- Still Matlab – the party is at the BASF2-Framework

New proposal: try CA with PXD in addition (only possible on ATCA)

CO2 Project at KEK

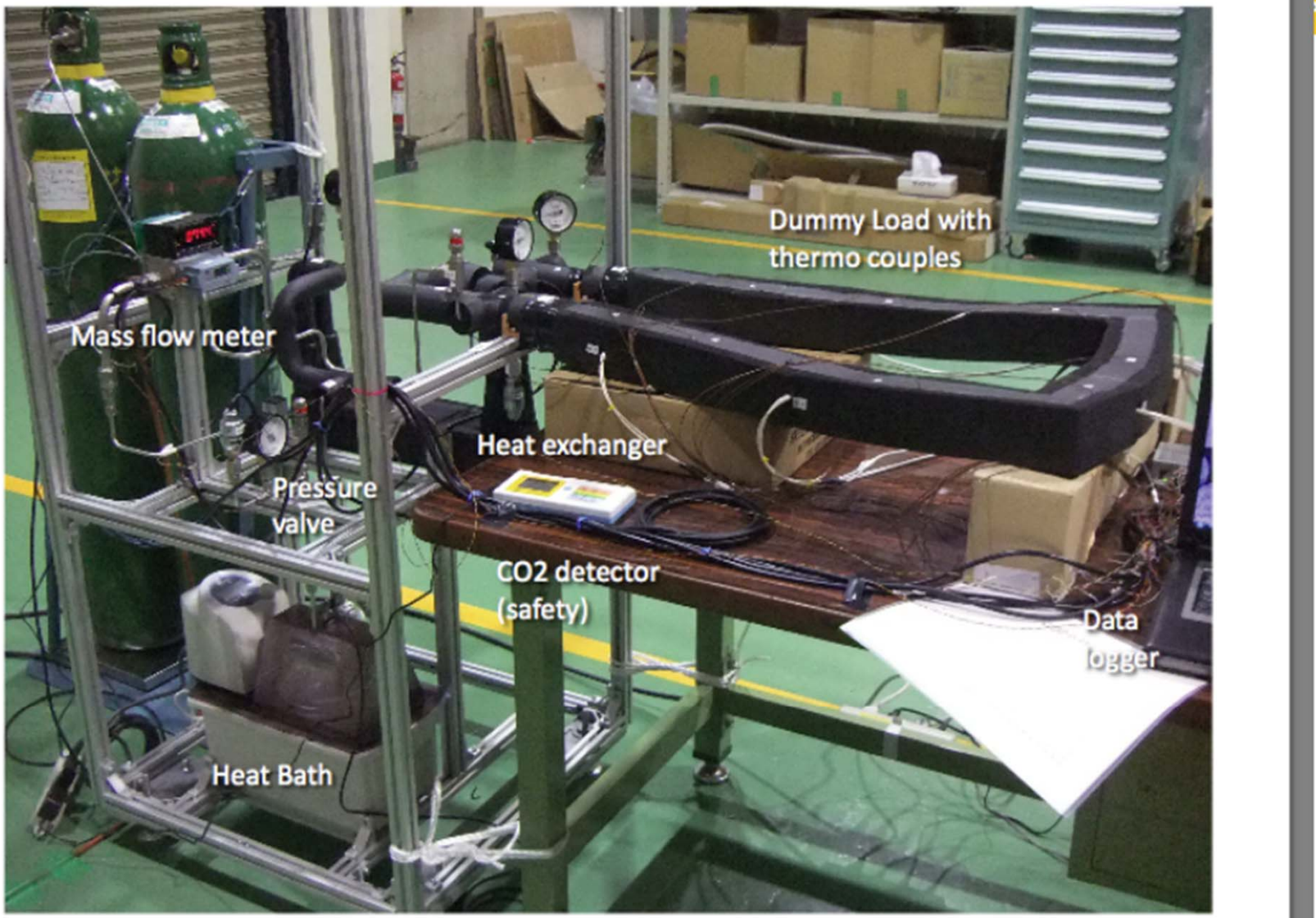
from T. Tsuboyama

History

- 2010 Spring:
  - Sugimoto, Fujii invited me to their new project on CO_2 cooling for ILC detectors aiming
    - Cooling of TPC readout boards (+20°C)
    - Cooling of CCD (-40°C)
  - The CO_2 system for Belle SVD/PXD aiming -20°C operation is included in this activity.
  - A proposal was submitted to the "KEK detector development projects" and temporarily approved.
- We started efforts to understand what CO_2 cooling systems are.

CO2 Project at KEK (cont.)

Open CO2 System at KEK (room temp.)



CO2 Project at KEK (cont.)

Summary of our experiments.

- Tests using the blow system was successful.
- The behaviors can be predicted reasonably.
- We experienced the system temperature is well controlled with the system pressure.
  - Temperature was NOT controlled well in the high temperature experiment because the system pressure was close to the pressure of the CO_2 cylinder.
  - Pressure control is important to keep the temperature constant.
- In the next step, we need to go to a closed system.

CO2 Project at KEK (cont.)

Backgrounds

- We have been wondering if a Nikhef/CERN CO_2 plant can be brought to KEK and operated as it is.
- If the system can not fulfill the regulations of Japan, we need to construct a system in Japan with certified parts by the Japanese government, which will require time, money and pain.
- Unfortunately, we, the KEK CO_2 group, do not know either the Japanese regulations nor the CO_2 system in CERN in detail.

CO2 Project at KEK (cont.)

Backgrounds

- We will visit the local government office on high pressure gas with two KEK cryogenic experts and explain the CO_2 system.
- The KEK cryogenic experts told me the system
  - Freon compressor whose motor power < 60 kW.
  - CO_2 compressor whose motor power < 3 kW.

  then the "small size refrigerator" regulations will be applied and strict/costly certification process can be avoided.

CO2 Project at KEK (cont.)

Backgrounds

- However, if the pressure in the CO_2 system exceeds 5 MPa at the room temperature, the "high pressure regulation" will be applied. The regulation/certification is more strict.
- Bart Verlaat told, in a E-mail, that CO_2 pressure can be as high as 11 MPa in the startup of the operation.

We made our KEK colleagues aware to consider the stored power (p x V) and not just the pressure

CO2 Project for PXD/SVD

Cooling of PXD with CO2 established (open and closed systems)

Concrete plans to build a closed CO2 System at MPI with the help of Nikhef/CERN, Vienna and Karlsruhe:

MARCO (Multipurpose Apparatus for Research on CO2)

prototype for common project “IBBelle”
(ATLAS IBL and Belle II)

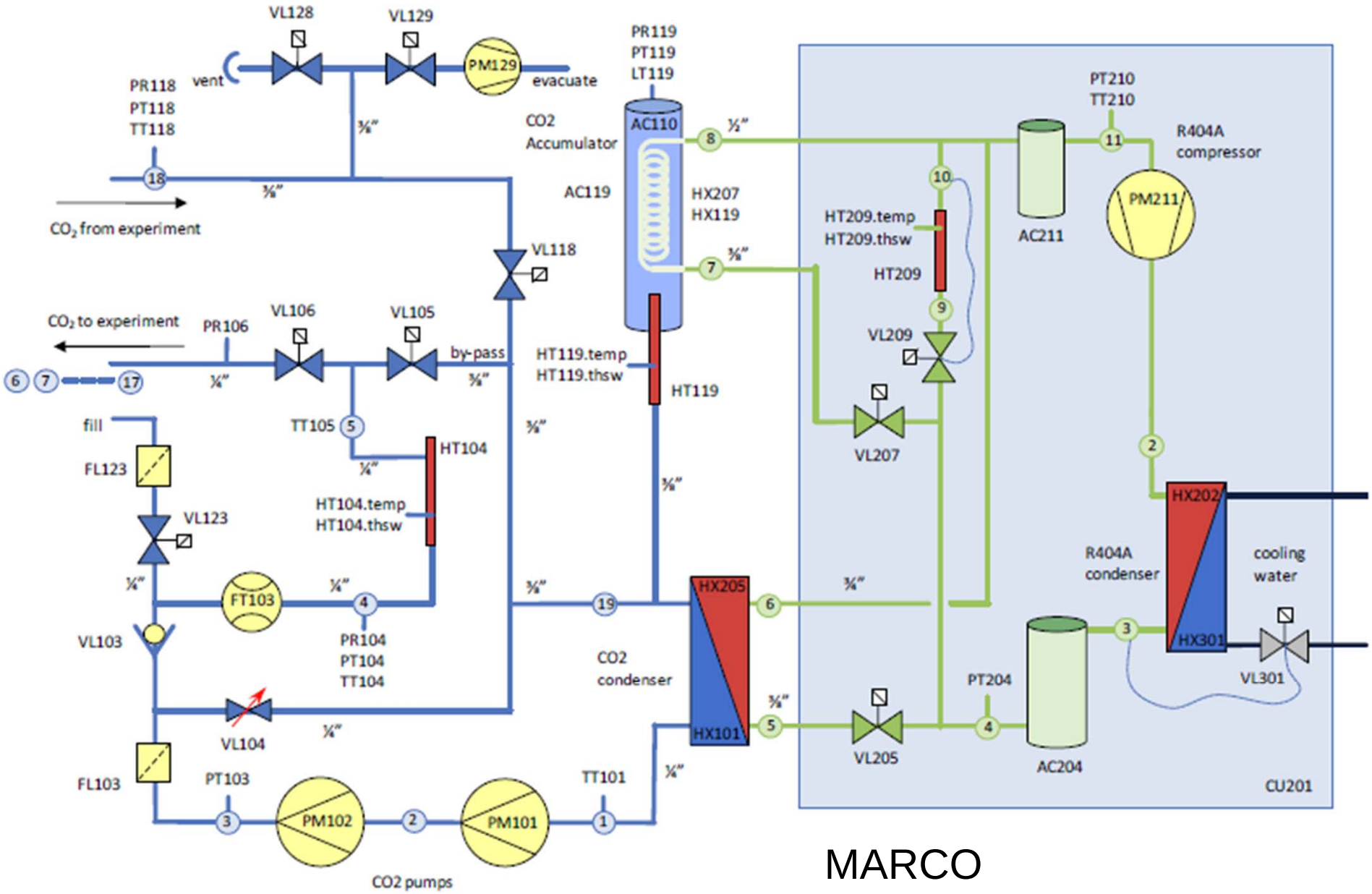
Immanuel Gfall in CERN for 2 months (supported by CF)

Learning phase started June 6 (- end July)

ordering of parts for MARCO next week (paid by CERN)

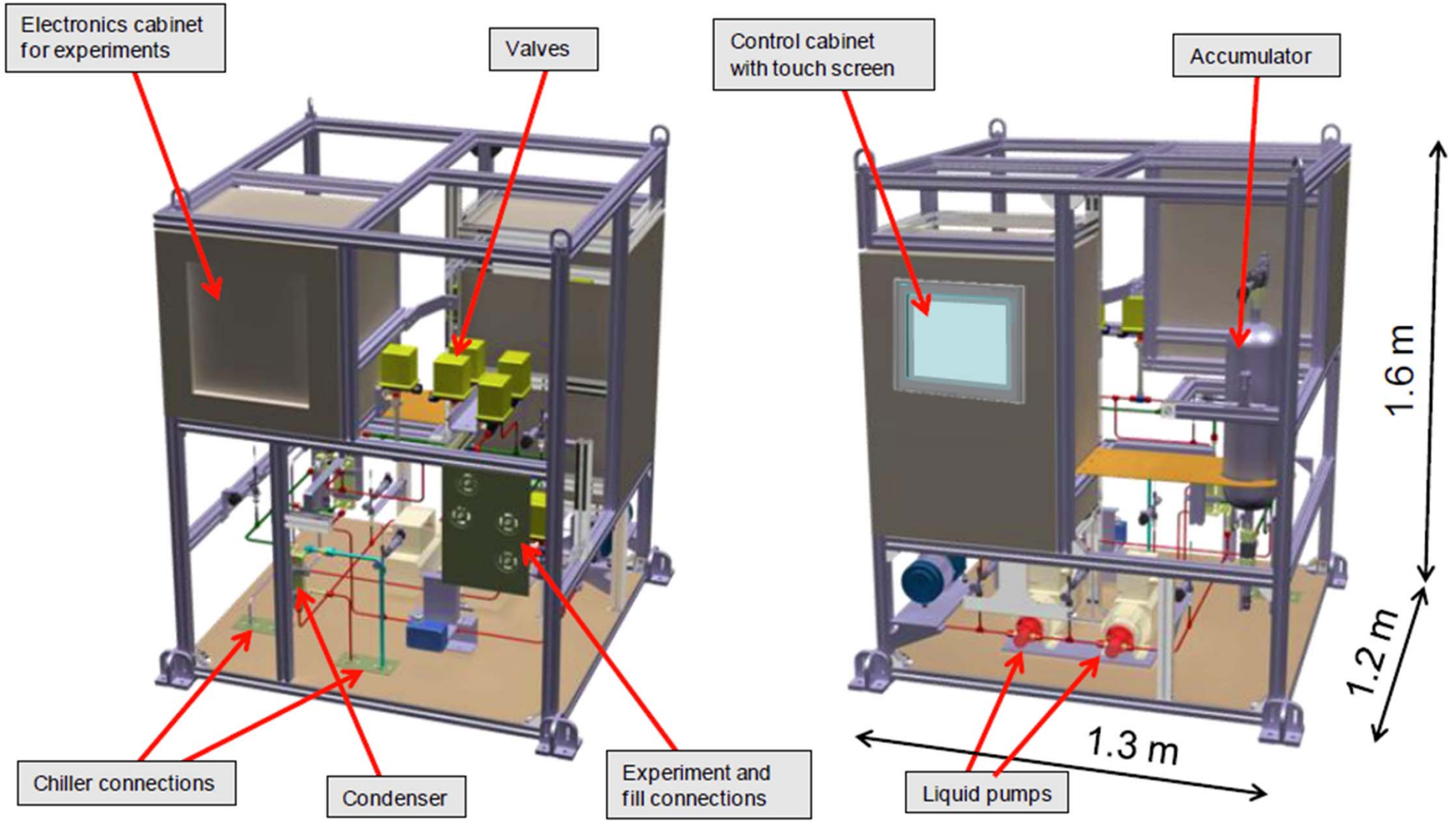
frame being done at CERN by MPI technician (by mid July)

CO2 Project for PXD/SVD (cont.)



MARCO

CO2 Project for PXD/SVD (cont.)



Frame with accumulator will come to MPI end of July for the piping job (orbital welding by new machine at MPI)

CO2 Project for PXD/SVD (cont.)

Further planning:

Pressure + tightness tests at MPI by September

involve TÜV for certification process (-> Japan)

Transport back to CERN

install electronic control systems (done by CERN)

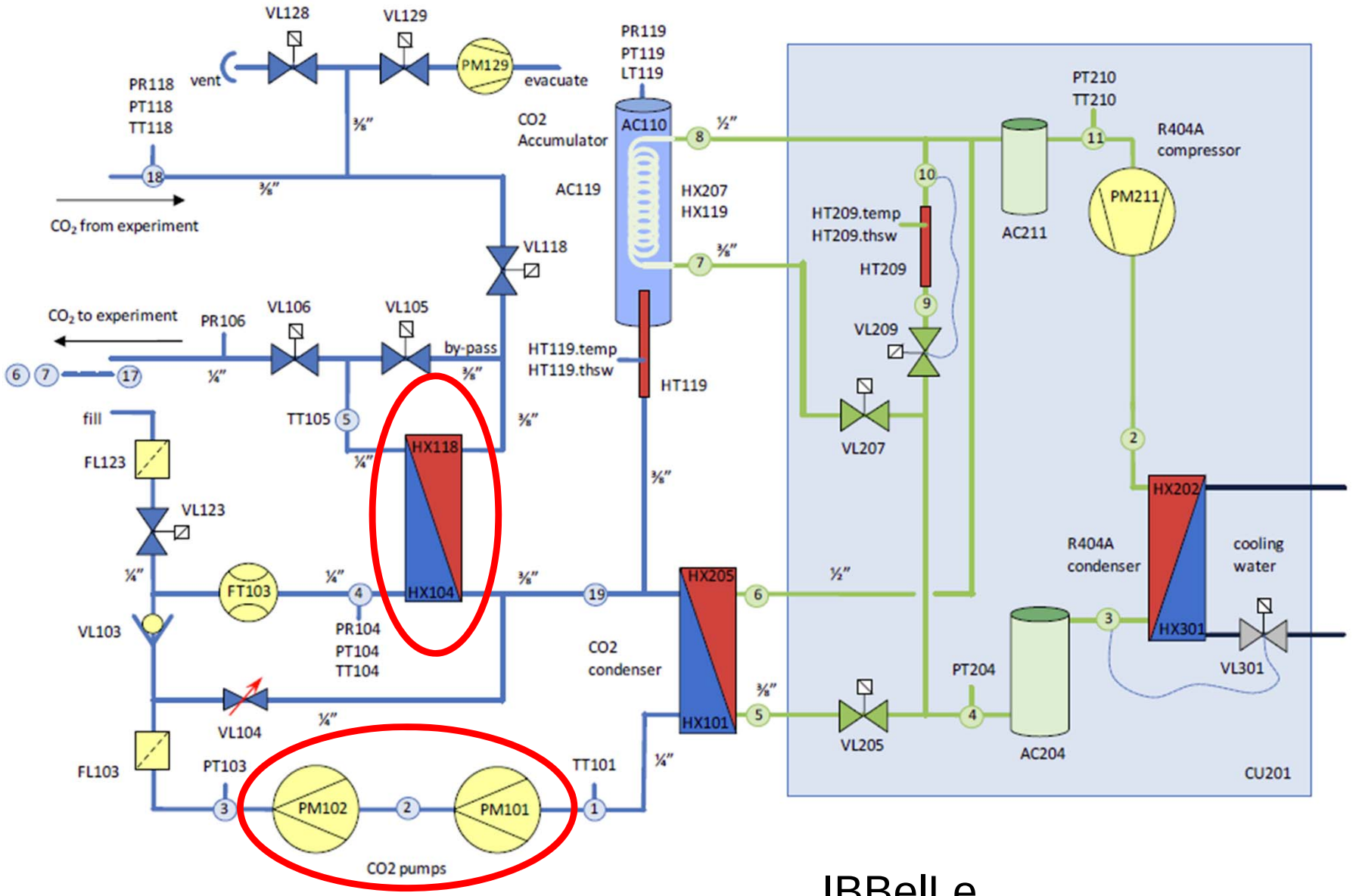
start commissioning (CERN / Vienna / MPI / Karlsruhe)

system ready for use at MPI by the end of 2011

Meanwile:

engineer work to upgrade to 2 kW cooling power
(pump, piping, chiller)

CO2 Project for PXD/SVD (cont.)



IBBelLe

CO2 Project for PXD/SVD (cont.)

Conclusions:

The common CO2 project with CERN / Nikhef , Vienna and MPI has started with 2 weeks delay

Rapid progress is being observed, time planning seems resonable

Closed CO2 prototype plant hopefully ready for use by early next year.

MPI will build at least 3 “IBBelLe” units:

one for CERN (ATLAS)
one for MPI / Vienna
one for Japan (most likely one more for redundancy

Test program with closed CO2 should now be thought off

Test Beam with Thin DEPFETs

Problem:

original date (July) cannot be met, DUTs not ready

request by Marcel Vos to SPS coodinator for autumn period

very unattractive off of parasitic running together with RD42 + others setup.

Solution:

found a nice period in October booked by Th. Bergauer for SVD (“Belle II”) -> Thomas is happy to have us in the beam

agreed with SPS coordinator to extend the run by 3 days (now have a total of 10 days).

Charm of the solution: First “all Belle II Silicon” in a beam.

Tentative Schedule for PXD/SVD Run

SPS Operation — Period 5 2011 Sep 13 to Oct 18

Schedule issue date: 11-June-2011 Version 1.0 (colour code: purple (dark) = scheduling meeting , light green (light) = weekend or holiday

	Tue 13 Sep	Wed 14 Sep	Thu 15 Sep	Fri 16 Sep	Sat 17 Sep	Sun 18 Sep	Mon 19 Wk38	Tue 20 Sep	Wed 21 Sep	Thu 22 Sep	Fri 23 Sep	Sat 24 Sep	Sun 25 Sep	Mon 26 Wk39	Tue 27 Sep	Wed 28 Sep	Thu 29 Sep	Fri 30 Sep	Sat 1 Oct	Sun 2 Oct	Mon 3 Wk40	Tue 4 Oct	Wed 5 Oct	Thu 6 Oct	Fri 7 Oct	Sat 8 Oct	Sun 9 Oct	Mon 10 Wk41	Tue 11 Oct	Wed 12 Oct	Thu 13 Oct	Fri 14 Oct	Sat 15 Oct	Sun 16 Oct	Mon 17 Wk42	Tue 18 Oct
Machine									8 BIG MD	8						8 WED MD	2 8													8 UA9 MD	2 8 FRI MD	8	2 8	
NORTH AREA T2 -H2									NA61-Protons Z Fodor proton							CMS-SiBT P Luukka														CREAM A Malinin H2B			CMS-CALO D Lazic			
NORTH AREA T2 -H4									SOIPIX M Battaglia							CALET S Torii								PEBS W Lustermann						FAIR H R Schmidt				
NORTH AREA T4 -H6									BELLE ARICH TOP R Pestotnik							SuperB S Bettarini								ATLAS-IBL H Wilkens					BELLE II SVD TH Bergauer			A-MMEGAS RD42 H Wilkens			
NORTH AREA T4 -H8																LHCb R Poeschl													CALICE			LHCb E Thomas			
NORTH AREA T4 -P0																																			
NORTH AREA T6 -M2																																	COMPASS muons		
-CNGS																																			
									8h Neutrinos							CNGS																				

For further information contact the SPS/PS-Coordinator