

# AIDA work package 8.6.1 – Support for common test beam for linear collider



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## 8.6.1 – Support for common test beam for linear collider:

- Central contribution to the planning and design of infrastructures
- Start of technical coordination structure
  - Access & support for general information and documentation systems
- "main goal of activities will be to ensure that different infrastructures are compatible and can operate together once installed"

## 8.6.2 – Development of common DAQ and control system (8.6.2)

Closely related to WP 9.5:  
**‘Granular calorimeter infrastructure’**

**Goals** – Support for common test beam for linear collider

Milestones & deliverables (**for CERN**):

- **Specification of EDMS** and DAQ (month 20, del.)
- **Testbeam, EDMS** and DAQ commissioning. (Month 36, milestone)

**Tasks** - CERN support for common test beam:

- Database (à la EDMS) for technical drawings
- Wire chambers, for beam definition
- Special (i.e. big) scintillators for HCAL calibration purposes

→ With DESY it has been agreed that the EDMS will be done compatible with the ILC EDMS.

The test beam requirements for all Linear Collider sub-detector experiments have been expressed at the East Area Day (WP 8.6):

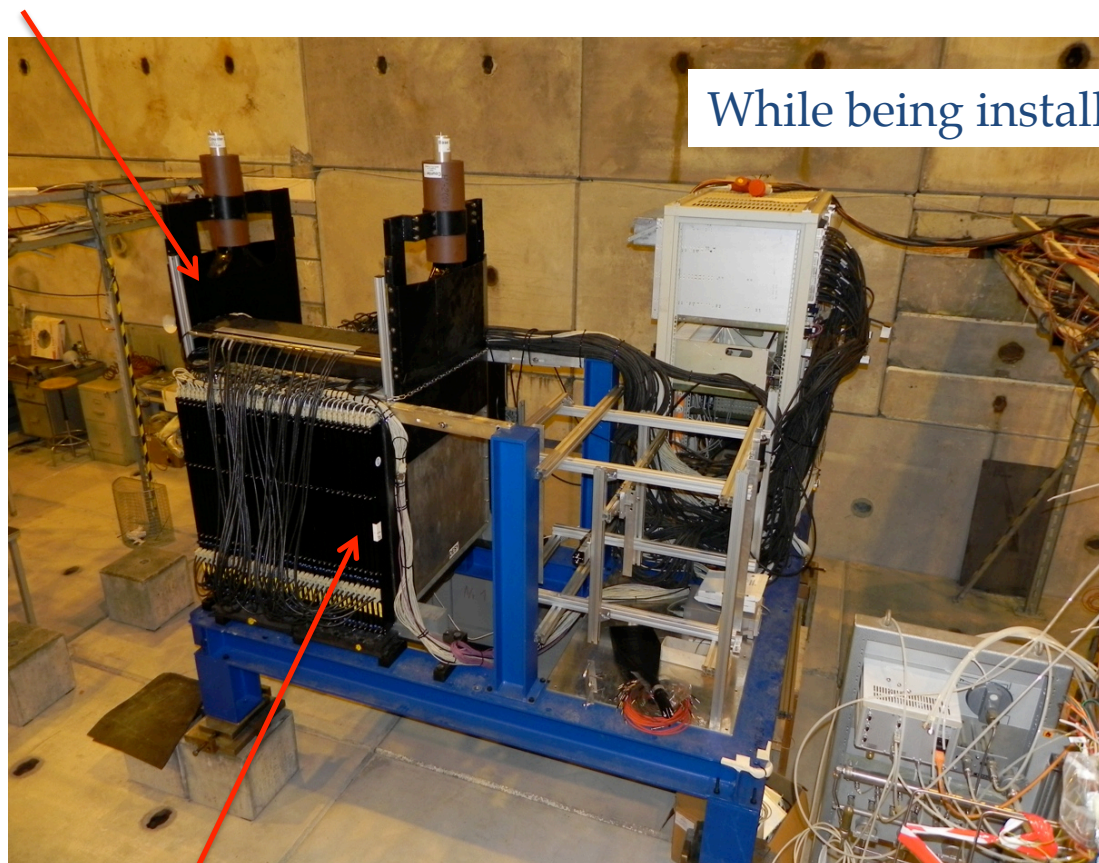
[https://indico.cern.ch/getFile.py/access?  
contribId=11&sessionId=5&resId=0&materialId=slides&confId=167761](https://indico.cern.ch/getFile.py/access?contribId=11&sessionId=5&resId=0&materialId=slides&confId=167761)

- NB: the (non-AIDA) goal of having all sub-detectors of a linear collider detector in a common test beam has been dropped.

CERN contribution to LC R&D has started with test beams for calorimeters (WP 9.5)

# Calorimeter infrastructure

80 x 80 cm<sup>2</sup> scintillators for calibration  
with muons (DESY property)



While being installed in SPS H8

SPS beam

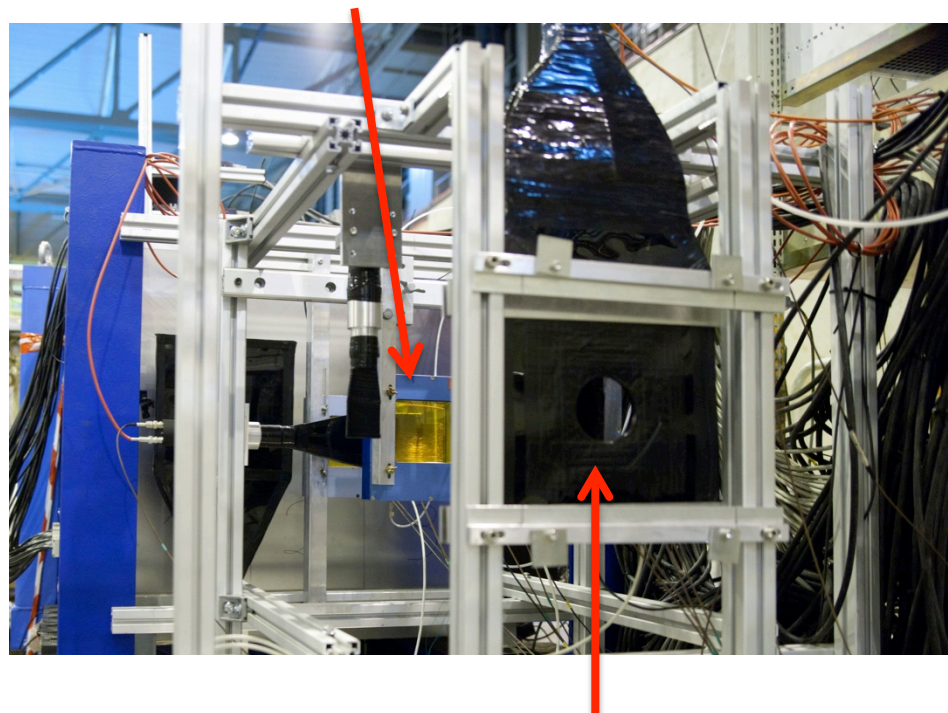
Tungsten stack (38 plates), here filled  
with scintillator planes



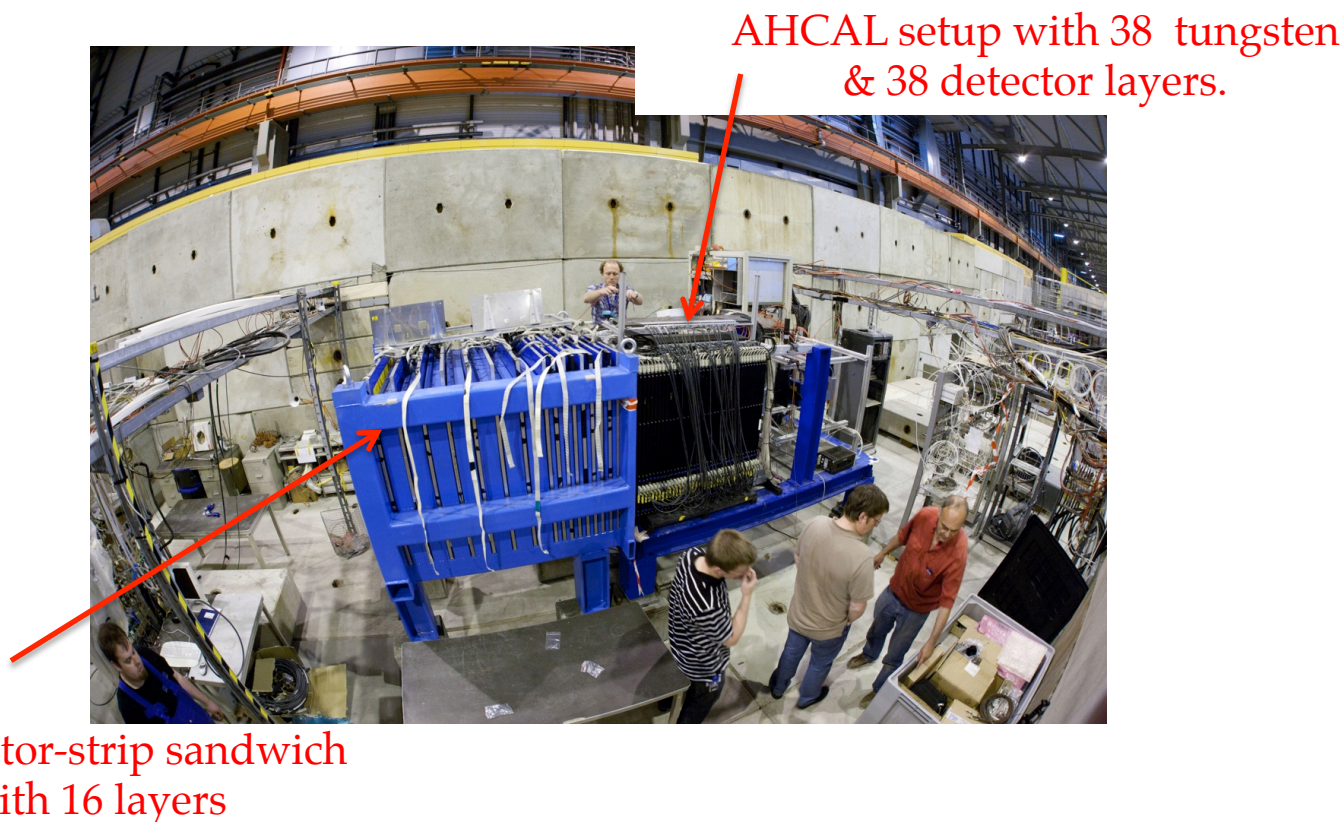
# Trigger setup

Extended trigger setup with two  $30 \times 30$  cm<sup>2</sup> to scan in detail over full surface for muons.

Wire chambers for beam definition



$20 \times 20$  cm<sup>2</sup> with a hole of 8 cm for vetoing



- Iron tail catcher absorber structure designed and constructed.
- Compatible with the tungsten absorber structure
- Used in test beams in second half of 2011.

This year the calorimeter test bench will be equipped with glass RPC detector with digital readout.

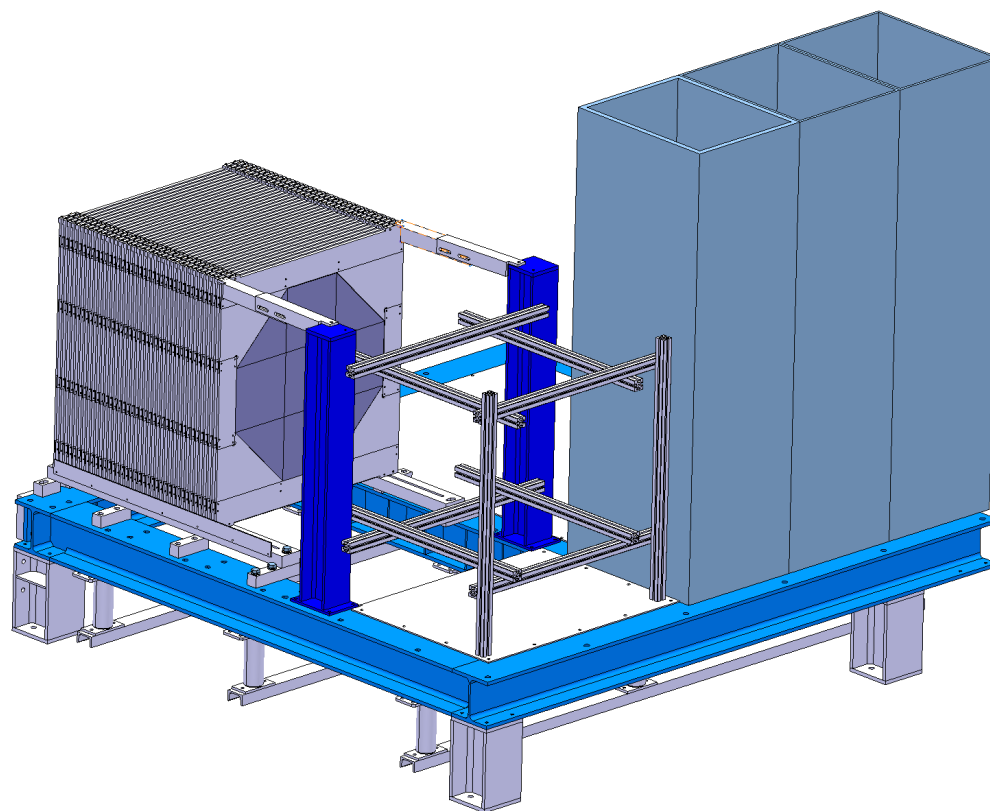
- Has been used in a Fe-HCAL prototype at Fermilab, Chicago.
- Currently still in the USA, to be shipped soon.
- Test beams scheduled so far:
  - 2 weeks in the PS T9, from **14 - 28 May**.
  - At the SPS H8 for 2 weeks in June, 1 week in August, 1 week in November.



# Adjustments to test bench

Covered by WP 8.6 and 9.5:

- Slightly increase gap sizes between tungsten plates.
- Cable basket underneath
- Feet are moved in, to fit on truck
- Extra electronics rack



Checked with [cet.cern.ch](http://cet.cern.ch):

- 34315 (EU):
  - Small tools (CHF. 350)
  - 1x trip to CALICE Heidelberg (CHF. 700)
  - 1x CALICE Heidelberg fee (CHF. 155)
  - 1x flight to Chicago, for discussion on 2012 setup (CHF. 880)
  - TOTAL: CHF. 2.080.
- 34305 (CERN):
  - CHF.37400, on two person-months for designer, and 2 person-months on fellow.

34315 (wp 8.6 - EU):

- ~ CHF.415 per month on electronics rental
- ~ CHF.2000 for mechanics work
- ~ CHF.590 for cooling equipment
- ~ CHF.265 for travel

- Iron tail catcher designed and constructed
- Trigger & tracking telescope has been extended
  - Integrated into DAQ
- Extensive beam tests performed with analog HCAL with scintillator active layers with tungsten absorber
- Preparations ongoing for tests with RPC active layers in same setup
- Design of various elements of the infrastructure is available and will be integrated into the central repository (EDMS).

# Backup



## **Task 8.6 - CERN support for common testbeam:**

- Database (à la EDMS) for technical drawings
- Wire chambers, for beam definition
- Special (i.e. big) scintillators for HCAL calibration purposes

## **Task 9.5 - Granular calorimeter infrastructure:**

- Readout infrastructure with picoscopes for T3B and gasRPC
- First version of bench structure for HCAL support has been constructed
  - Needs to be extended for a tail-catcher, triggering & positioning
  - At the moment a support frame for the trigger setup is in front: needs to be moved, and ECAL bench needs to be installed
  - Entire frame is to be made movable

**Implementation plan**  
**WP8, PH-LCD**

version: EvdK, 20/03/2012

**Budget holder:** Erik van der Kraaij  
**Budget codes:** EU 34315  
CERN 34305

**PPA code:** RLC-PRJ

WP.task	PPA	EU funding to project (CHF)	Budget code for EU funding	CERN funding for project (CHF)	Budget code for CERN funding	Person-Months	Personnel direct costs (EU funds)	Consumable and prototype direct costs (EU funds)	Travel direct costs (EU funds)	Personnel direct costs (CERN funds)	Consumable and prototype direct costs (CERN funds)	Travel direct costs (CERN funds)
WP8.6	RLC-PRJ	95,700	34315	114,700	34305	18	95,700			65,900	42,200	6,600

**EU-part of budget allocation (CHF)**

**Code 34315**

category / year	2011	2012	2013	2014	total	Total EU fund.	Plan
staff (PSI)	0	0	0	0	0	70000	95700 Manpower
fellow (PFE)	0	30000	20000	20000	70000	25700	0 Consumable + travel
materials (M)	11800	1600	10700	1600	25700		
total	11800	31600	30700	21600	95700		

**CERN-part of budget allocation (CHF)**

**Code 34305**

category / year	2011	2012	2013	2014	total	Total CERN fund.	Plan
staff (PSI)	21000	21000	21000	0	63000	113000	65900 Manpower
fellow (PFE)	20000	10000	0	20000	50000	0	48800 Consumable + travel
materials (M)	0	0	0	0	0		
total	41000	31000	21000	20000	113000		

**EU versus CERN post by post**

Item	P-M	2011	2012	2013	2014	cost	% EU	% existing department resources	% additional CERN resources	EU	existing department resources	additional CERN resources	total CERN
Designer (Erik Richards)	4	2m	2m	0	0	42,000	0%	100%	0%	0	42,000	0	42,000
Designer (to be confirmed)	2			2m		21,000	0%	100%	0%	0	21,000	0	21,000
Erik van der Kraaij (fellow)	3	2m	1m			30,000	0%	100%	0%	0	30,000	0	30,000
New Fellow	2				2m	20,000	0%	100%	0%	0	20,000	0	20,000
Erik van der Kraaij (fellow)	3		3m			30,000	100%	0%	0%	30,000	0	0	0
New Fellow	4			2m	2m	40,000	100%	0%	0%	40,000	0	0	0
Purchase of a tool			10000	9100		19,100	100%	0%	0%	19,100	0	0	0
Travel		1800	1600	1600	1600	6,600	100%	0%	0%	6,600	0	0	0
	18								Totals	95,700	113,000	0	113,000
Planned	18									95,700			114,700

- It was decided in February 2011 that the ILC desy EDMS would be extended / used. See talk by Ties Behnke
- <http://indico.cern.ch/getFile.py/access?subContId=1&contribId=10&resId=1&materialId=slides&confId=125222>