



# EUDET-NA2: Detector R&D Network

Status report - Extended SC meeting 31/08/09  
K. Desch - Bonn University

Networking Activity

## Objectives:

- provide common framework for detector R&D
- develop and deploy common tools for all JRAs
- integrate with world-wide R&D efforts for ILC detectors
- create human network between partners

Well focused individual tasks to provide specific common tools  
to be used by all partners with clear prospects for durable benefit

# EUDET-NA2: Organisation



## 6 Tasks:

|         |  | Partners                 | Task leader             |
|---------|--|--------------------------|-------------------------|
| COMP    | High performance computer cluster      | DESY, IPASCR, TAU, UBONN | P. Wienemann (UBonn)    |
| ANALYS  | Common analysis framework              | DESY, IPASCR, UBONN      | F. Gaede (DESY)         |
| WEBINFO | Web-based information system           | TAU                      | H. Abramowicz (TAU)     |
| VALSIM  | Simulation tools for hadronic showers  | CERN                     | J. Apostolakis (CERN)   |
| MICELEC | Access to deep-sub-micron technology   | CERN                     | A. Marchioro (CERN)     |
| EXCHG   | Human network for information exchange | All                      | <b>F. Sefkow</b> (DESY) |



# NA2-COMP

Installation and deployment of a distributed (grid-enabled) computing facility for the analysis and simulation of test-beam data

## Status:

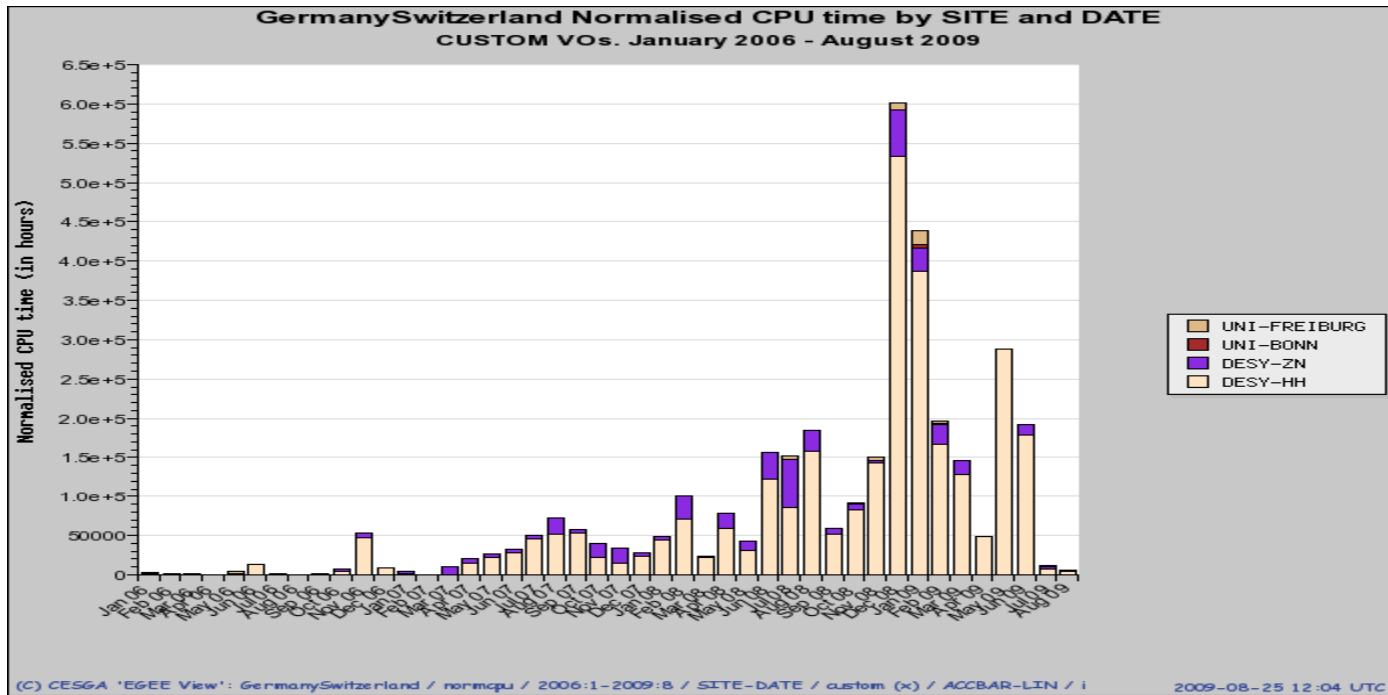
- Clusters at DESY, UBONN, TAU, IPASCR fully installed
- Fully grid-enabled (within WLCG, VOs:  
ilc and calice)
- Fully integrated into world-wide computing resources for ILC detector R&D and design  
(but TAU down...)

EUDET Grid @UBONNN





# NA2-COMP



| Site         | Normalised CPU hours | Percentage |              |
|--------------|----------------------|------------|--------------|
| DESY-HH      | ~3 000 000           | ~85 %      |              |
| DESY-ZN      | ~470 000             | ~13 %      |              |
| UNI-FREIBURG | ~46 000              | 1.3 %      | (voluntary!) |
| UNI-BONN     | ~7 400               | 0.2 %      |              |

DESY is providing by far most of the (used) resources - mainly from own contribution (not EUDET money)

# NA2-COMP



TAU:

- Contributed < 1000 normalised CPU hours between 2006 and 2008
- TAU-LCG2 site was shutdown in summer 2008 and new IL-TAU-HEP site was opened due to re-structuring of Israeli HEP grid infrastructure (with the advantage of significantly more shared resources for ilc)
- new site still not back to status "certified" due to problems ("... nobody knows where the problem comes from.")

will be followed up...

# NA2-COMP



Regularly used by all three JRAs for testbeam  
data storage and analysis -  
ILC/EUDET storage: 60 TB of data

JRA1 - EU Telescope data - 2 TB

JRA2 - LCTPC/Large Prototype data, recently started

JRA3 - Calice Testbeam data > 60 TB

ILC/ILD Simulation > 20 TB



# NA2-COMP

## Milestones and Deliverables:

|        |                        | planned | achieved |
|--------|------------------------|---------|----------|
| M      | 1st stage installed    | 10      | 10       |
| M      | 2nd stage installed    | 22      | 22       |
| M      | Full cluster available | 34      | 34       |
| NA2-D6 | Full cluster available | 34      | 34       |
| NA2-D8 | Final report           | 60      | on track |

## Outlook:

- No further milestones/deliverables except final report
- Maintain the infrastructure
- Regular „production“ usage by all partners



# NA2-ANALYS

Development of a common data analysis and simulation infrastructure (software)

see F. Gaede's talk

## Milestones and Deliverables:

|        |                    | planned | achieved |
|--------|--------------------|---------|----------|
| M      | Version 1          | 18      | 18       |
| NA2-D3 | Version 1 deployed | 18      | 18       |
| NA2-D8 | Final report       | 60      | on track |





# NA2-WEBINFO

Development of a web-based information system for exchange of information between partners, easy document access, interaction with international partners

## Status:

- [www.eudet.org](http://www.eudet.org) existing and heavily used
- central repository for all internal and external EUDET information (EUDET memos, EUDET reports, announcements, recruitment, ...)

|        |                    | planned | achieved |
|--------|--------------------|---------|----------|
| M      | Version 1          | 12      | 12       |
| NA2-D1 | Version 1 deployed | 12      | 12       |
| NA2-D8 | Final report       | 60      | on track |

# NA2-VALSIM

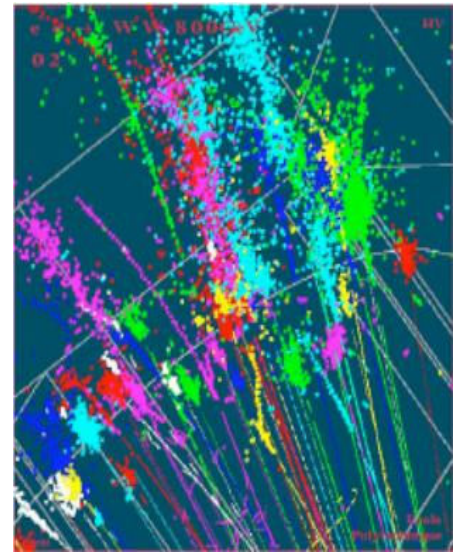


Improve and develop simulation tools modeling of hadronic showers and create the validation tools for fine-grained calorimeters

## Status:

- Task carried out within world-leading simulation suite *Geant4*
- Most closely connected to JRA3
- Many improvements of hadronic shower simulation since start of EUDET: shower profiles,  $e/m$  ratio, hadronic cross sections, neutron transport, electro-magnetic cascade at endpoint (Bragg peak)
- Dedicated session with JRA3 to prepare detailed comparisons of *Calice/JRA3* data with improved *Geant4* simulation at 3rd annual meeting

Shower simulation  
based on *Geant4*





# NA2-VALSIM

## Milestones and Deliverables:

|        |                        | planned | achieved |
|--------|------------------------|---------|----------|
| M      | First new release      | 18      | 18       |
| NA2-D4 | First release deployed | 18      | 18       |
| NA2-D8 | Final report           | 60      | on track |

## Status/Current activities:

- Continue improvement of hadronic modelling (V. Uzhinsky/CERN)
- ongoing discussion (meeting in March09) on use of CALICE data to improve hadronic modelling

More interaction with JRA3 expected during remainder of EUDET

# NA2-MICELEC

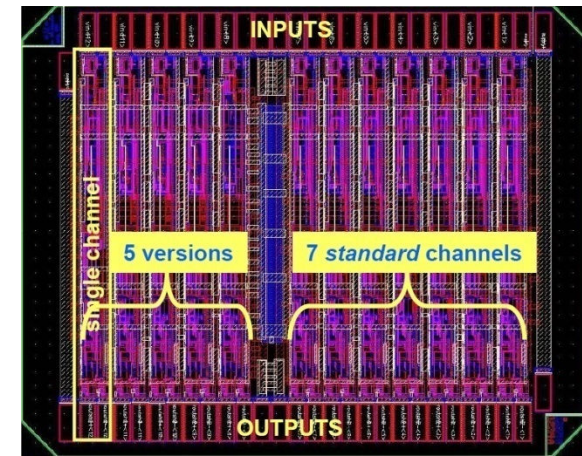


Facilitate access to deep submicron technologies for radiation-tolerant microelectronics. Design support and coordinated access to a commercial silicon foundry for prototyping and production of integrated circuits in deep submicron CMOS technologies.

## Status (at time midterm review)

- foundry contract for 130nm technology negotiated
- specific design tools acquired and deployed to EUDET partners
- 4 training courses on advanced digital design
- hands-on course in IC tester
- ASIC projects supported by MICELEC:  
PASA, TimePix, SiStrip r/o, S-Altro, ...
- Generic IC blocks deployed: 10bit-FADC, coder-decoder

Programmable charge amplifier designed with MICELEC support



# NA2-MICELEC



## Milestones and Deliverables:

|        |              | planned | achieved |
|--------|--------------|---------|----------|
| NA2-D8 | Final report | 60      | on track |

## Outlook:

- No further milestones/deliverables except final report
- Continue community support and training for ASIC development

# NA2-EXCHG



Human network:

Encourage visits at partner institutes to intensify collaboration.

Organisation of an Annual Scientific Workshop.

Status:

- kickoff meeting + three successful annual scientific workshops (Hamburg, Munich, Palaiseau, Amsterdam)
- invitation of external experts to annual meeting
- travel for associates for critical tasks (eg. PCMAG magnet)



EUDET Annual Workshop



# NA2-EXCHG

## Milestones and Deliverables:

|            |                    | planned | achieved |
|------------|--------------------|---------|----------|
| NA2-D2 + M | 1st annual meeting | 10      | 10       |
| NA2-D5 + M | 2nd annual meeting | 22      | 22       |
| NA2-D7 + M | 3rd annual meeting | 34      | 34       |
| NA2-D9 + M | 4th annual meeting | 46      | on track |
| NA2-D10 +M | 5th annual meeting | 58      | on track |



# NA2-Financial issues

currently none known to coordinator...

## NA2-Summary

- Activity is well on track
- No more milestones except final reports
- Make sure the provided tools keep being used