

# Minutes of "Tele25 Kick-Off Meeting" 11 July 2018

By: Marcel, Jan, Hendrik

**Participants:** Jan, Yi (ATLAS), Hendrik, Doris, Claus K., Daniel, Guenter E. (CMS), Karsten H., Inge, Pradeep (FE), Trixi (FS-DS), Ingrid, Marcel (ATLAS), Ties (FLC/MT), Felix (FLC/AIDA2020)

## Input slides

See: [https://confluence.desy.de/download/attachments/99492802/kickoff\\_tele25\\_final.pdf?api=v2](https://confluence.desy.de/download/attachments/99492802/kickoff_tele25_final.pdf?api=v2)

- Jan gave a short re-cap on the history of the telescopes, the three columns (hardware, DAQ, Reco)
- Hendrik summarizes the outcome of various workshop & reviews
  - Key messages: Telescope used by many different groups from various experiments
- Short Term: Documentation, operation, squeeze out the optimum out of the current hardware
- Mid-Term: Several ideas (see slides), Alpide is currently prime candidate, experience is good, but spatial resolution is inferior
- Long-Term: What would be nice (see Slides), Own Sensor development?
  - Ingrid: Sensors should be suitable for all beam lines (CERN, DESY, FNAL, ELSA)
  - Marcel: ALPIDE and own sensor development not mutually exclusive
  - Hendrik: If new DAQ system for mid-term solution is developed, make it suitable for both mid- and long-term (e.g. ALPIDE and own sensor)

## Discussion: What can we do at DESY?

### Status

TLU:

- Daniel: Trigger-Unit is also a bottle-neck
- Jan: new AIDA TLU works with 1 MHz

EUDAQ:

- Daniel: How to deal with different DAQs? Jan, Hendrik, Marcel: EUDAQ is generic, can run various chips already, Jan: modular framework

Mimosa26:

- Trixi: How long would Mimosa26 last?
- Marcel, Ingrid, Hendrik, Jan: 3-5 years most likely, no clue about the end-of-life issues; at SPS 6 sensor died in the last 5 years, 10 spares for 5+2 telescopes

### Existing candidates

ALPIDE is not the ultimate candidate, but brings along improvements (besides spatial res.) in comparison to Mimosa, is cheap and available

Daniel: Other candidates: DEPFET (BelleII), 50x50 pitch, pulse height information, but availability poor, slow production and slow r/o, costly

Someone: Moench, 25 x 25, but with ASIC, and not designed for tracking

Karsten: Ongoing dev. of CMOS-DEPFET for DSSC until 2019, camera for XFEL.

- Has Bump-Bonding ASIC on the back > 700 mum
- Trixi: getting rid of this is highly non-trivial

Daniel: HV-CMOS, Mu3e MuPix8, AMS-foundry refuses new orders from science. In principle a HV+HR-CMOS could be thin and "fast enough"

Ties: FPCCD dev. at KEK, 8x8 pitch, ...

Marcel: We need 2x2 cm area, and at least 100 chips being available

Hendrik: Monolithic SOI (e.g. Cracow, 30 x 30, below 2 um resolution, not thinned yet)

### Own development

Marcel: Use this as a tool to kick-start development

Trixi: Will this work with Mimosa Life-time

Ingrid: Two-Step approach: First Alpide, start in parallel with novel development; Jan: Modular framework provides smooth transition for users

Daniel: AlpidePRIME, remove event buffers needed for LHC operation (trigger latency), and re-synthesize on smaller real estate

Other considerations:

- Alignment for 1 mu, has its own complication
- Mixed Design, Timing layer ...
- Continuity and support

### Now needed:

Ties: Market survey of candidates

Trixi: Find out the Delta: What can we have? – What do we want?; and if possible requirements for the far future 10 years

Trixi: In Photon Science: Identify key users and then look if you can also please others  
core requirements and nice-to-have list for convincing the management/directorate

Ties: Fundamentally, we should do it! Go for a new system:

1. Market Survey, Specifications, prospects and detailed proposal do now!
2. Decision and Agreement
3. Realisation (Money + Manpower)

Felix: Timing is the hot topic

Jan: An extended beam tool for wider community (e.g. calorimeters)

Other arguments: DESY sources, export options (successful for EUPHOTO) e.g. GeV energies, infrastructure support/management

## Funding outlooks

Attract, maybe problematic as also European framework as AIDA

DSF: Money for exploration and reasons why not funding it from core? We can get a post-doc for two years check

DDL Helmholtz: from 2022 10 million invest later, R-Weg e.g.

ERC: ambitious in 2 ways

Matter Forum: EUDAQ2 for Proposal (This fall) 1 Person (PostDoc)

## Beam Sources at DESY

DESY II TBF is unique

Hendrik: New beam lines will need new tools Beam line needs

R-Weg is happening:  $10^{10}$  electrons in 2ns every 80-160ms.

Jan: What about EU-Praxia beam tools?

Marcel: DESY IV is coming, maybe with slow extraction

## TODOs

- Market survey
- Specs (hard requirements) and wish list (nice-to-haves) for new sensor, check overlap with FS needs for possible synergy (Heinz, Trixi, Allesandro, ...)
- Funding: DSF, Matter Forum, internal DESY funds