

Advanced Implantation Detector Array (AIDA)

HISPEC/DESPEC meeting 24 September 2019

presented by
Tom Davinson
on behalf of the AIDA collaboration
(Edinburgh – Liverpool – STFC DL & RAL)

Tom Davinson
School of Physics & Astronomy
The University of Edinburgh

Done

- 1x MSL type BB18(DS)-1000 installed
- 1x Plastic scintillator installed
DSSSD+Plastic Scintillator operate together OK with γ -ray sources
- AIDA FEE64 firmware updated
now supports 1GHz, 64 bit White Rabbit timestamp
- In-beam commissioning with $\sim 150\text{MeV/u}$ ^{107}Ag ions (April 2019)
- AIDA data forwarded to MBS
see presentation by Andrew Mistry
- AIDA hardware to support 2x AIDA 24cm x 8cm DSSSD (1024 channels)
available at GSI – more AIDA hardware available

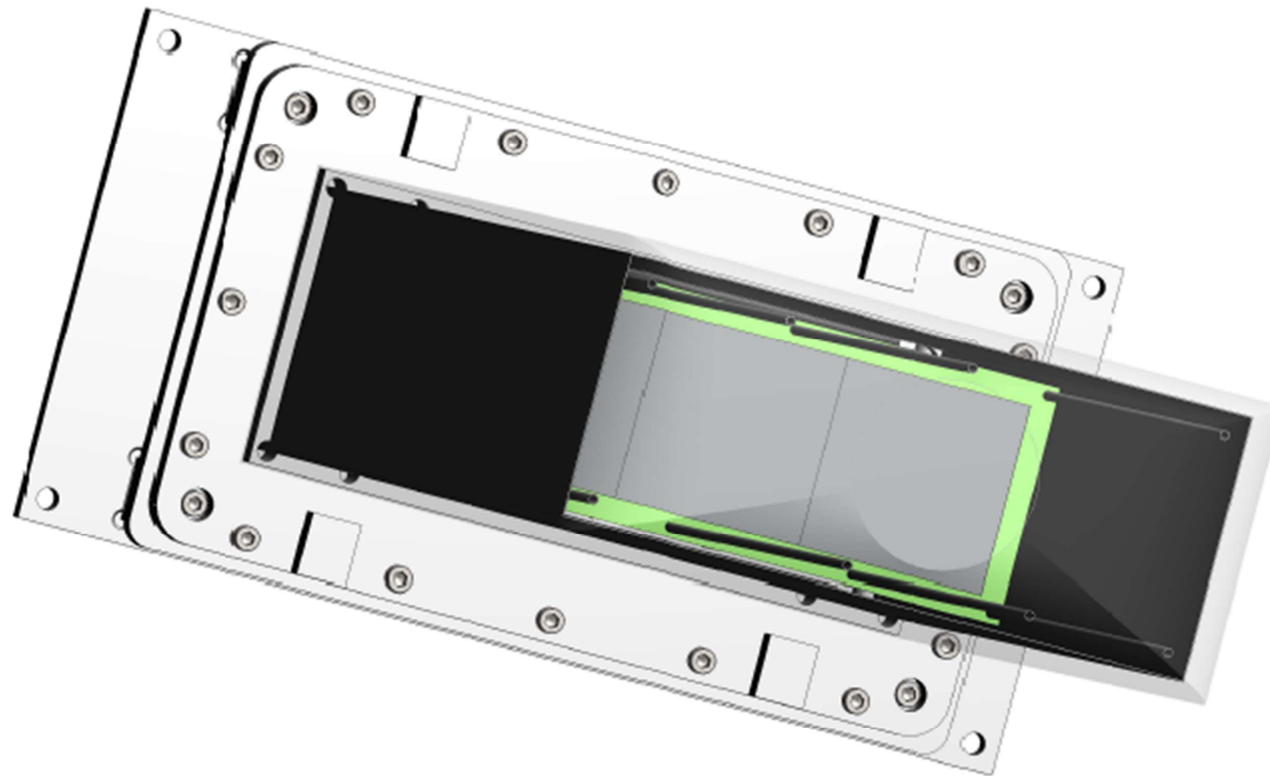
To Do

- Plastic scintillator (8cm x 8cm DSSSD) – mechanical issues identified
extant design OK for *upstream* detector
increase transverse dimensions for *downstream* detector
- Plastic scintillator – AIDA DSSSD interactions for high energy ions?
effect of high energy signals?
no scintillator wrapping – light?
crosstalk?
- Reduce AIDA snout length by 5cm to accommodate length of plastic scintillator cables
- Obtain AIDA+FATIMA data with pulser and sources
- Commissioning with fragments December 2019
AIDA 8cm x 8cm DSSSD
- Install AIDA 24cm x 8cm DSSSD and support assembly
when? January 2020?
availability of plastic scintillator?

AIDA 24cm x 8cm DSSSD

AIDA 24cm x 8cm DSSSD support assembly designed by Peter Black (Edinburgh)

Mechanical compatibility with FATIMA checked by Ian Burrows et al. (STFC DL)

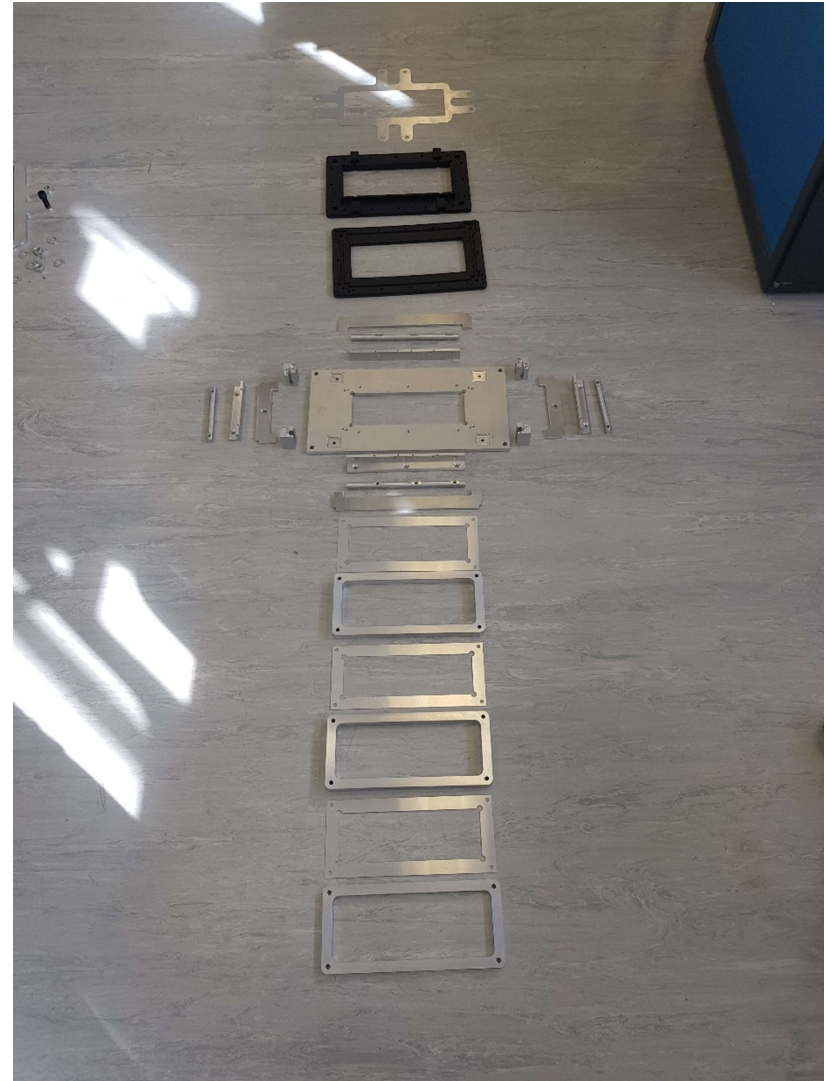


AIDA 24cm x 8cm DSSSD

Components for AIDA 24cm x 8cm DSSSD
have been manufactured

To complete require snout length

- fabricate snout
- purchase Titanium tubing
- purchase ribbon cables
- c. 4-6 weeks



Acknowledgements

- AIDA collaboration

<http://www2.ph.ed.ac.uk/~td/AIDA/welcome.html>

- Edinburgh

Corrigan Appleton, Peter Black, Carlo Bruno, Oscar Hall, Phil Woods

- UKRI STFC Daresbury Laboratory

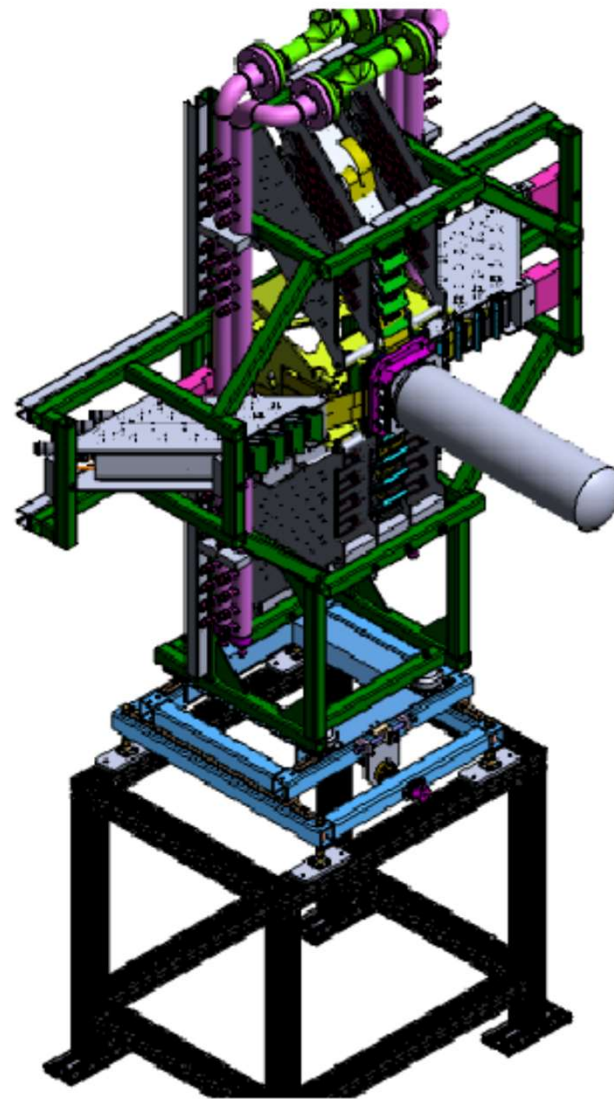
*Ian Burrows, Patrick Coleman-Smith, Mike Cordwell, Alan Grant,
Vic Pucknell*

- GSI

*Helena May Albers, Sultan Alhomaiddhi, Juergen Gerl, Magda Gorska,
Nic Hubbard, Nik Kurz, Andrew Mistry, Henning Schaffner, Arici Tugba*

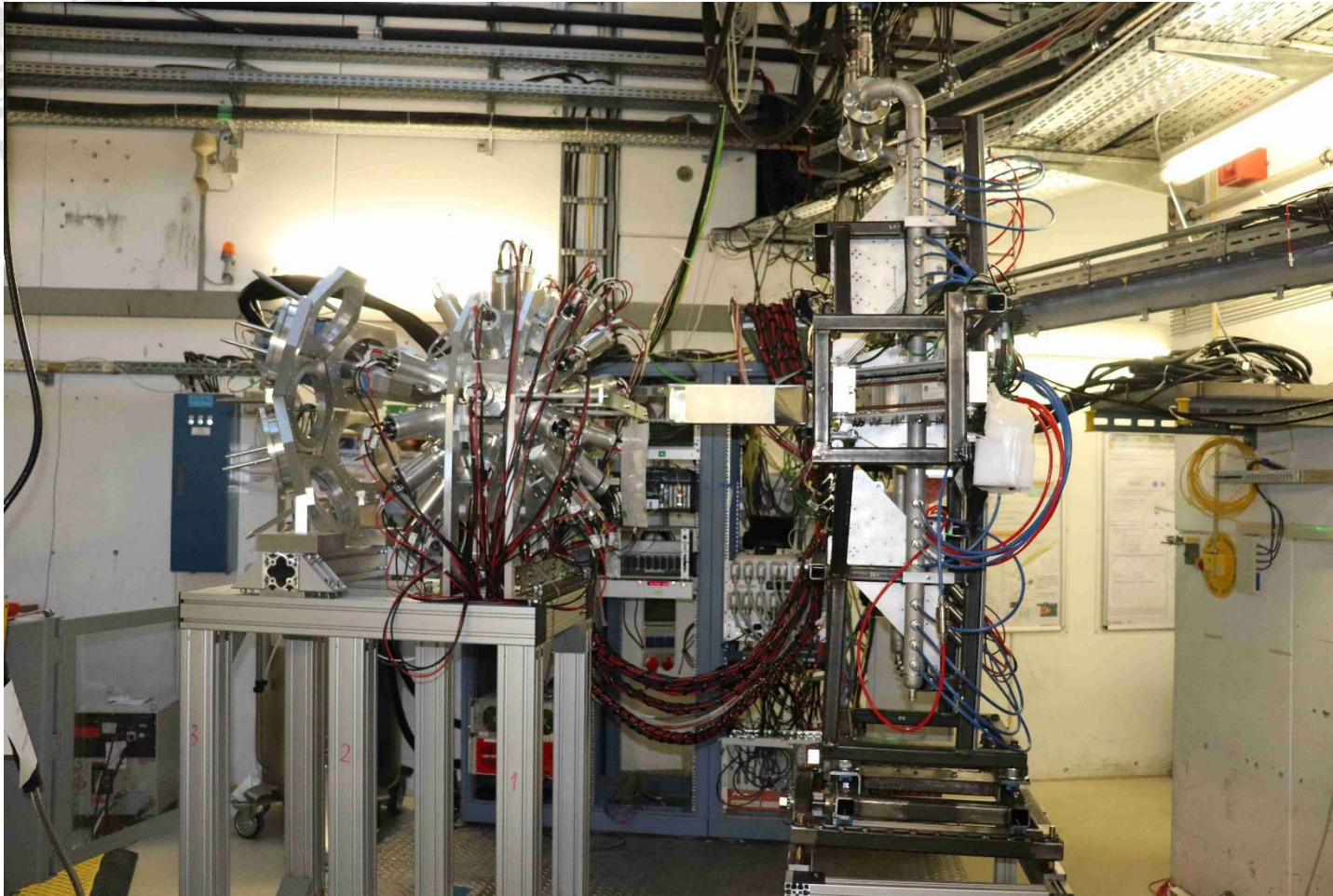
AIDA Support Stand – the plan

- *AIDA support stand*
8cm x 8cm & 8cm x 24cm DSSSDs
- *Overhead services routing*
ac mains power
2x Gbit Ethernet
cooling water
White Rabbit
etc
- *Temperature controlled cooling water*
+20 °C

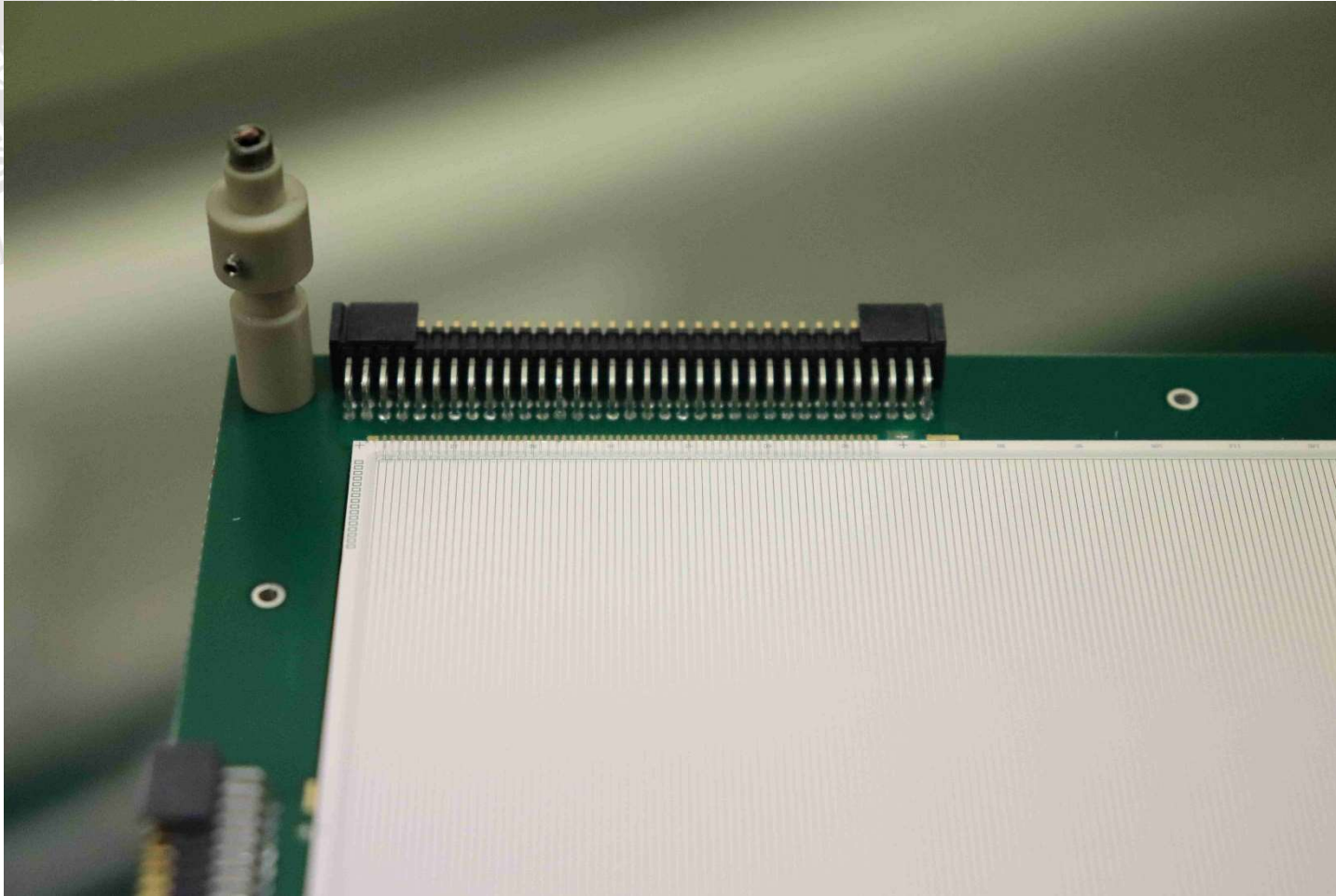


<https://www2.ph.ed.ac.uk/~td/AIDA/Information/information.html>

S4: AIDA + FATIMA

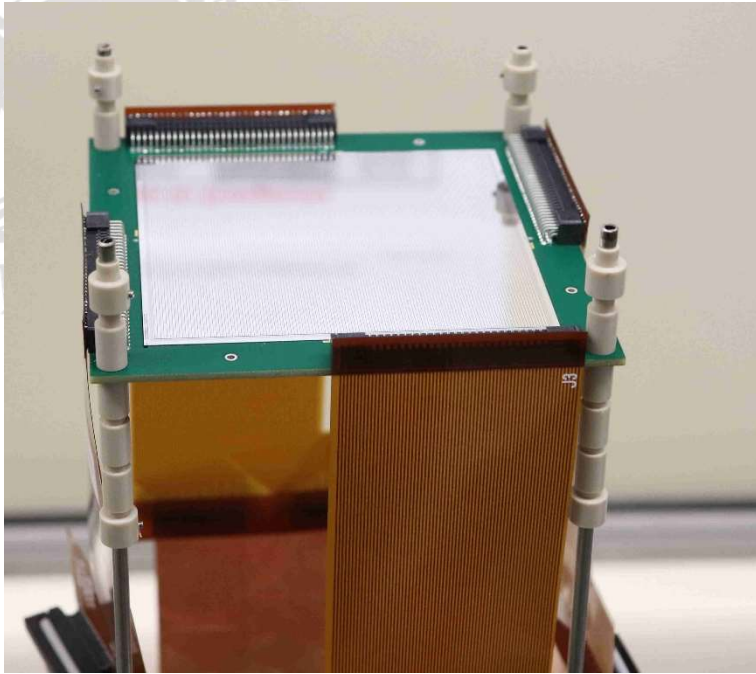


AIDA DSSSD: MSL type BB18(DS)-1000

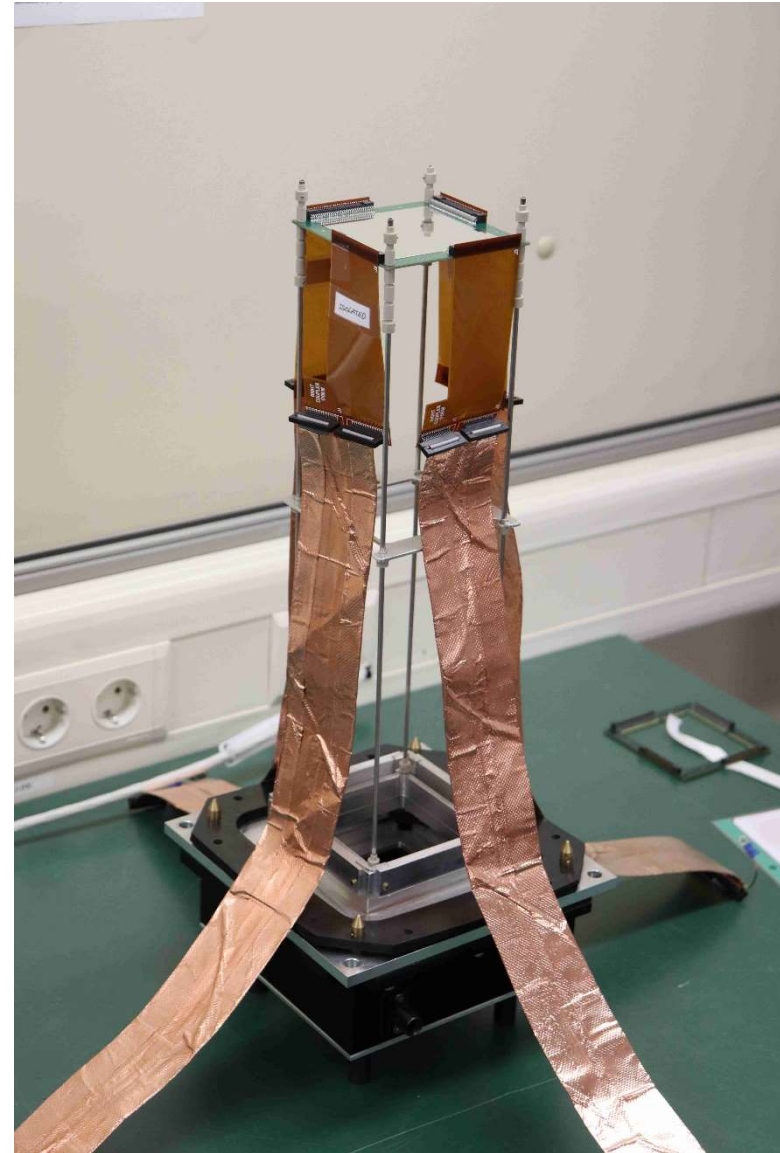


Detail – 1 (of 4) connectors, strips, bond wires, bias ring, multi-guard ring, field plate etc

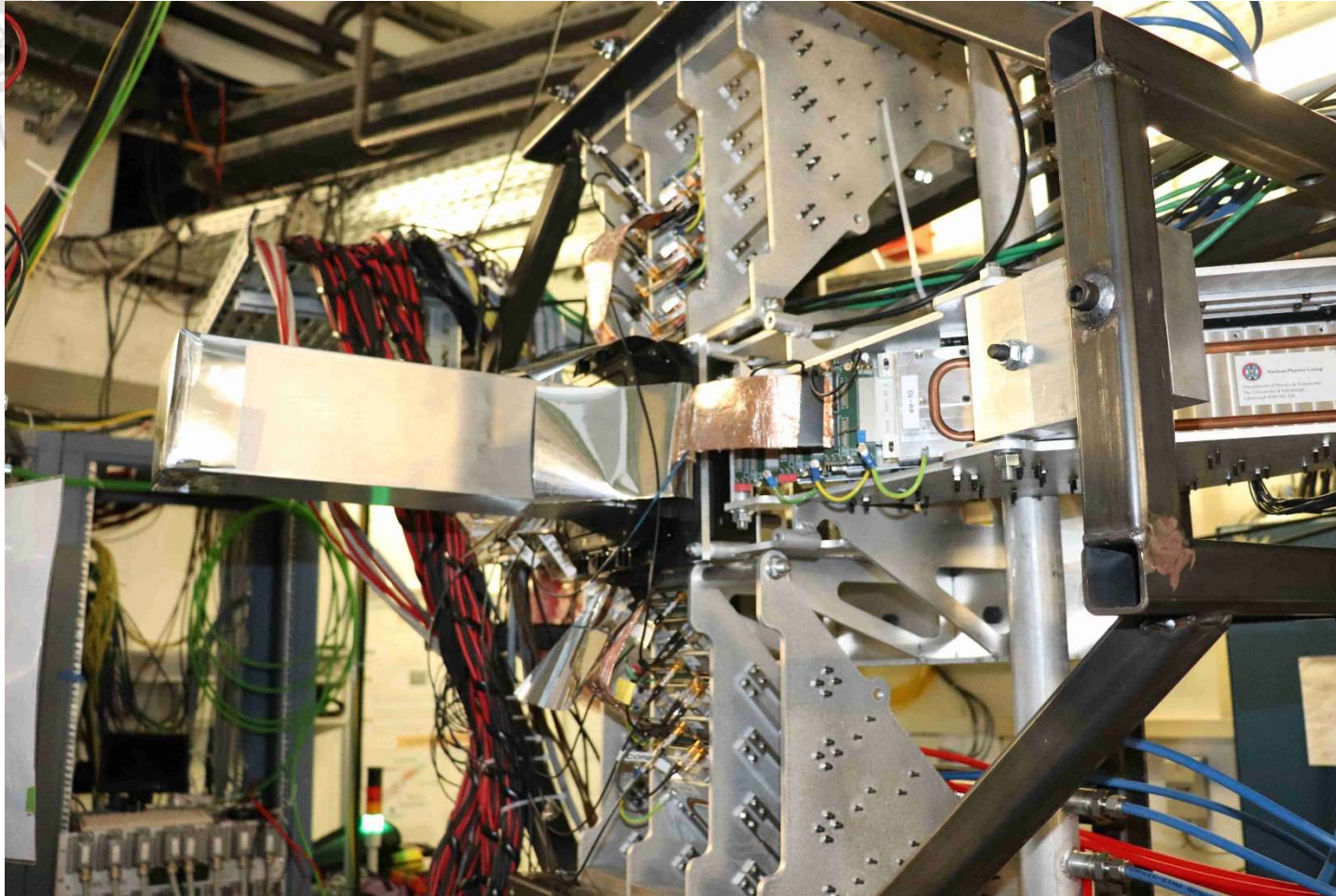
AIDA DSSSD: cabling



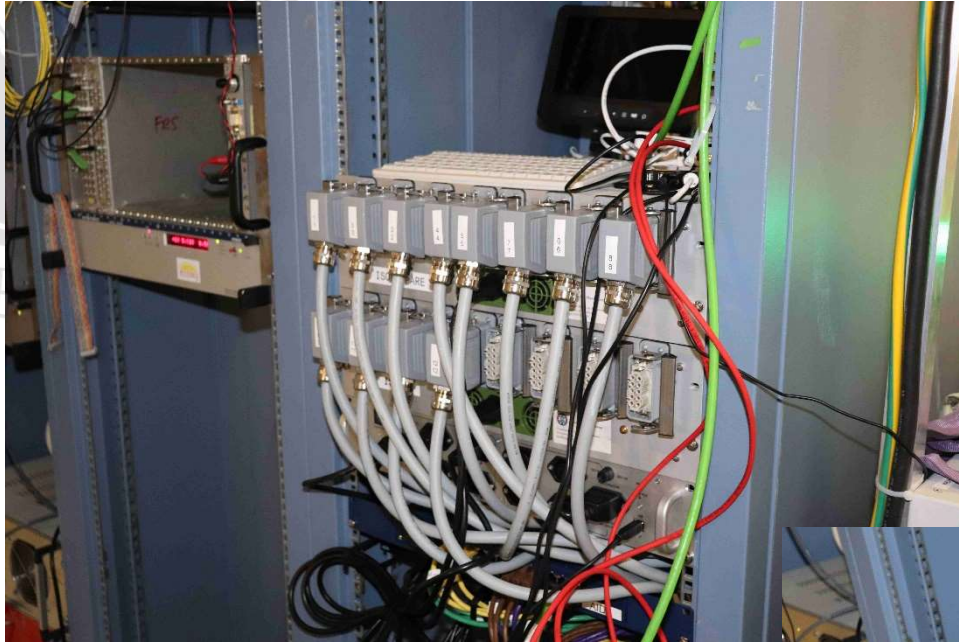
Kapton PCB +
3M 1245 wrapped Samtec ribbon cables



AIDA: snout and FEE64s



AIDA: 19" rack hardware



*For 4x 8cm x 8cm DSSSDs
(1024 channels)*

USB-controlled ac mains relay
FEE64 PSUs
Gbit network switch

MACB WR timestamp distribution
Pulser
Detector bias

