Trigger Tower Simulation
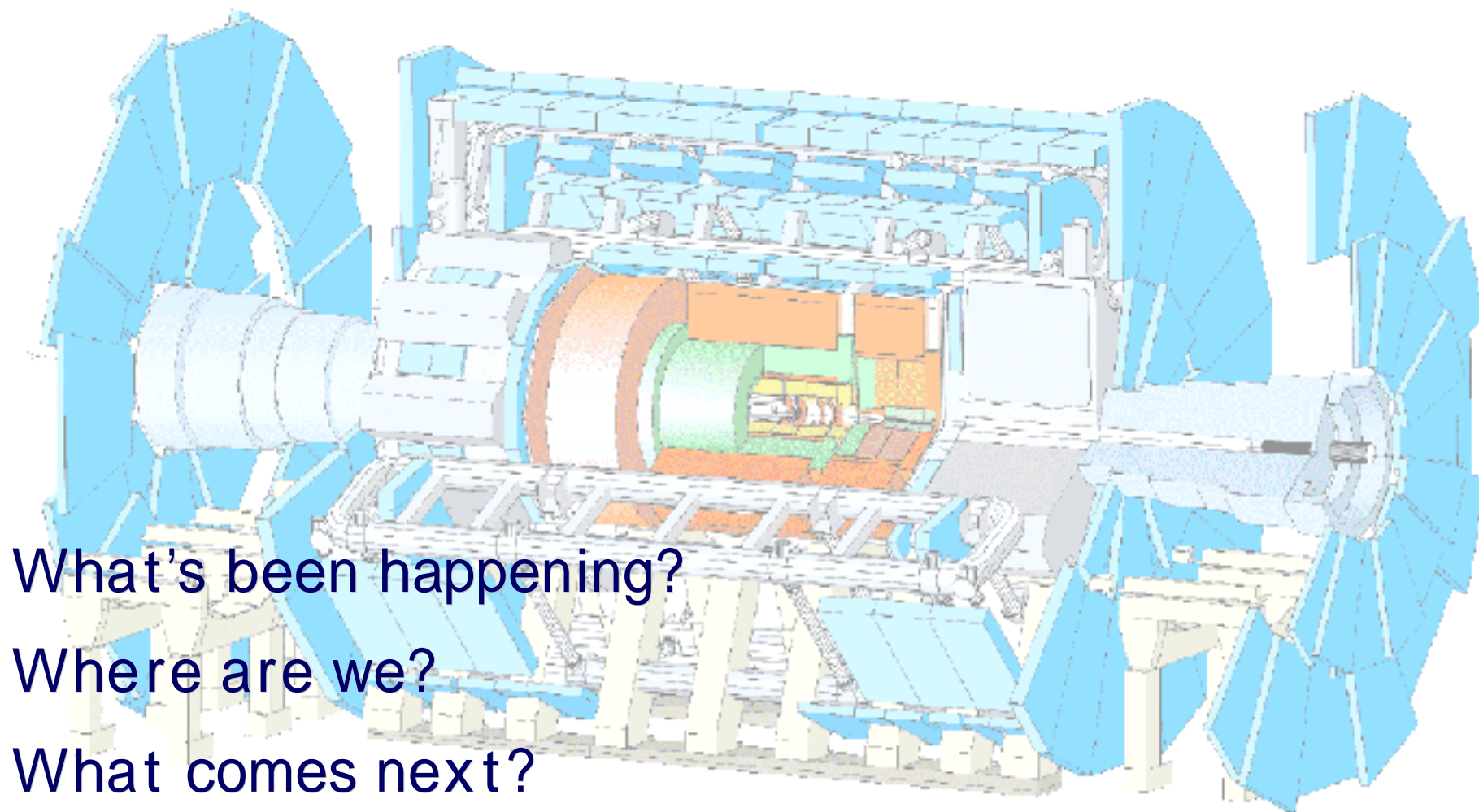
What's been happening?

Where are we?

What comes next?

At last Joint Meeting:

- Tile towers seeme to be wor!ing
- "Ar towers ha ma#or signal an noise calibration problems
  - Turne out to be more $un amental than %' thought
- Some lac! o$ mutual un erstan ing between Trigger&"Ar
- ' $$ort problems on both si es

No(ember "Ar wee!:

- Meeting to iscuss situation an re)uirements
  - M*sel$ plus room $ull o$ "Ar crew :+,
  - –er* pro ucti(e . man* issues clari$ie

"Ar e$$ort impro(e :

- /abienne now has assistant with % enti$iers, lea(ing her some time $or "Ar"0Sim

Ma#or so$tware re(isions:

- "Ar"0Sim completel* rewritten
  - 1loser match to our re)uirements
  - More input $rom har ware experts
- Man* changes to "Ar in$rastructure 2e.g. % enti$iers,
- Man* AT"AS so$tware changes as well
  - Nothing stan s still $or long3

New "ArTT"0s:

- 4 time samples
  - 5 $or /%6 plus one be$ore an one a$ter
- 7ulse amplitu e in Me-
  - 1alibration right or er, but still to be tune
- Noise, with autocorrelation an correct relati(e scale
- Still some etector&geometr* issues
  - Towers at barrel&en cap transition
  - More /1A" etails nee e

Working first prototype in TriggerTowerMaker

- Reads "LArTT"0 and TileTT"0 inputs
  - Coordinates agree with Calocell inputs
  - Tile tower E_T consistent with Calocells 2"Ar right order,

- Performs /%6 81%9, /%6® E_T :"; T<

- Outputs TriggerTower objects
  - Unchanged in initial version 2re)uires some !lu ging,
  - Changes to TT will be needed for persistency

- Some things not pretty
  - Too many parameters set by hand

>igh+' $_T$ pion:

● 1alo1ell inputs

```
Trigger Tower Maker    DEBUG TT has coords (4.36934, 0.75 and energies    !, "3 (E#,$ad%
Trigger Tower Maker    DEBUG TT has coords (4.46753, 0.75 and energies    ", 9 (E#,$ad%
Trigger Tower Maker    DEBUG TT has coords (4.!7""6, 0.&5 and energies    0, " (E#,$ad%
Trigger Tower Maker    DEBUG TT has coords (4.36934, 0.&5 and energies    7!, "& (E#,$ad%
Trigger Tower Maker    DEBUG TT has coords (4.46753, 0.&5 and energies    30, "3 (E#,$ad%
Trigger Tower Maker    DEBUG TT has coords (4.5657!, 0.&5 and energies    0, " (E#,$ad%
```

● TT"0 inputs

```
Trigger Tower Maker    DEBUG TT has coords (4.36934, 0.75 and energies    4, "5 (E#,$ad%
Trigger Tower Maker    DEBUG TT has coords (4.46753, 0.75 and energies    3, "0 (E#,$ad%
Trigger Tower Maker    DEBUG TT has coords (4.!7""6, 0.&5 and energies    0, " (E#,$ad%
Trigger Tower Maker    DEBUG TT has coords (4.36934, 0.&5 and energies    "35, !" (E#,$ad%
Trigger Tower Maker    DEBUG TT has coords (4.46753, 0.&5 and energies    57, "! (E#,$ad%
Trigger Tower Maker    DEBUG TT has coords (4.5657!, 0.&5 and energies    0, " (E#,$ad%
```

– "Ar TT calibration is arbitrar* in this printout

– Match o$ coor inates an Tile ' $_T$ are ! e* points here

– %n general towers)uieter with TT"0 inputs 281%9 suppresses noise?,

So what's still nee e ?

Minimal:

- /inalise "Ar TT"0 calibration
- 1on$irm recent $ixes correct localise coor inate problems
- Tune :"; T< TT calibration $or ph*sics

Next steps:

- A   /1A"
- ' xten TT ob#ects to contain more realistic in$ormation
  - 1urrent esign base on single+sample, high+precision ' T storage an cru e)uantisation
- 8etter access to TT"0 properties
  - e.g. 6ea   pulse shapes rather than assume

TrigT01alo bro! en in ?.0.@

- 7roblem is that AtI$ast' (ent bro! e a$ter ?.@.@
  - :! nown< problem, but $ix seems slow coming
  - am about to 2temporaril*, remo(e AtI$ast+ epen ence so that can ma! e progress
- Term has starte
  - % on't ha(e long be$ore a ministration ta! es me out o$ action

7lan

- Aet something that can be use $or stu ies release in next wee! or so
  - 7retti$* it later3

Where do we want to be?

Need to update TriggerTowers

- Current design not natural for realistic processing
- Should be able to simulate actual bytestream
  - need at least to contain multiple digitisation samples
- Design for persistence needs careful thought

Want bytestream converters for TT data

- Need to discuss testbeam&monitoring requirements
- 60% formats need checking also
  - though those we've looked at so far more up-to-date than we expected