Software Summary

- **Recent Progress**
  - ◆ **Accelerator Tools**
  - ◆ **New AFE Format**
  - ◆ **GRID**

- **Outstanding Issues**
  - ◆ **Database**
  - ◆ **DATE readout**
  - ◆ **EPICS readout**
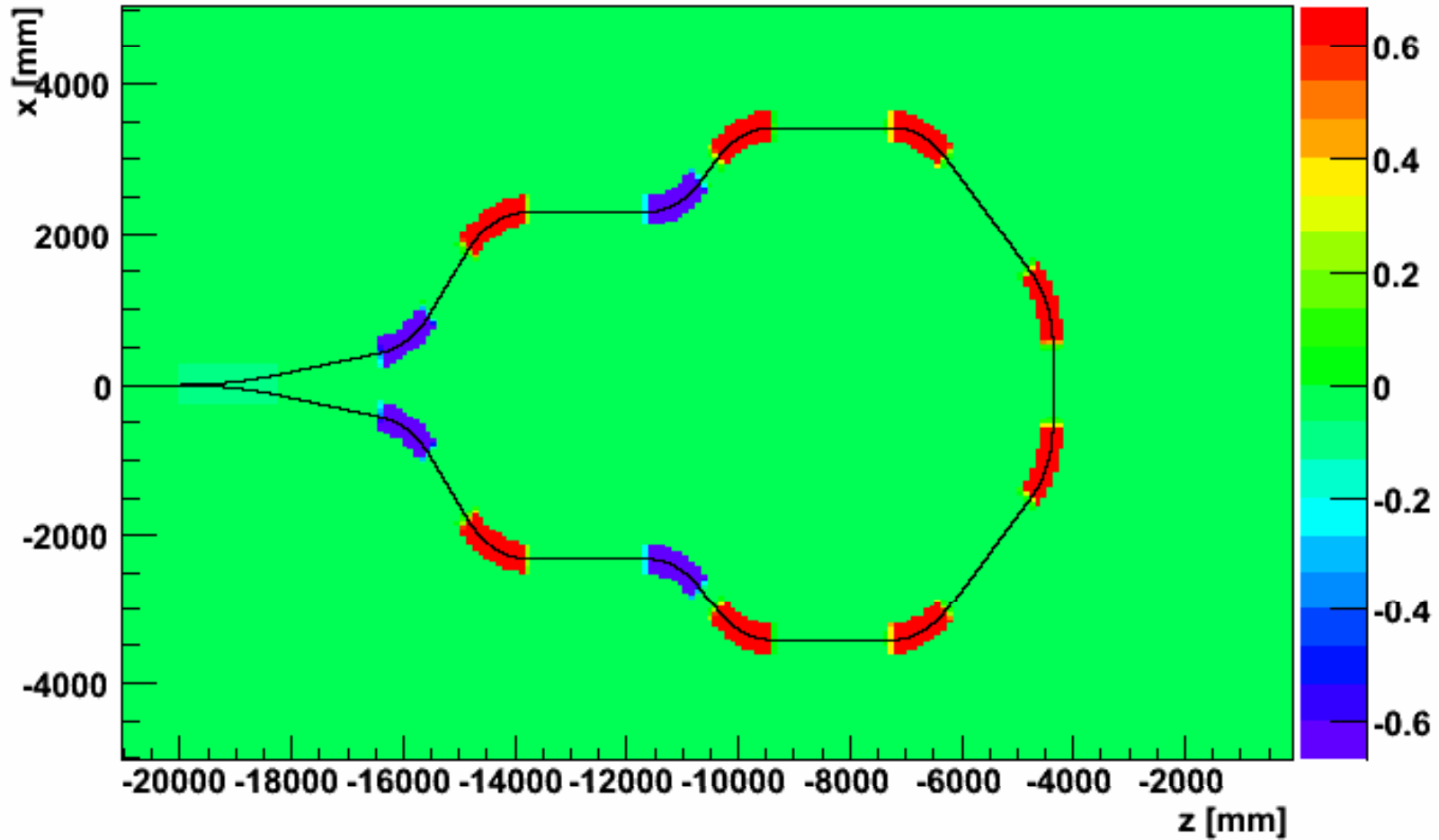 - ◆ **Software Review**

- **Software Schools**
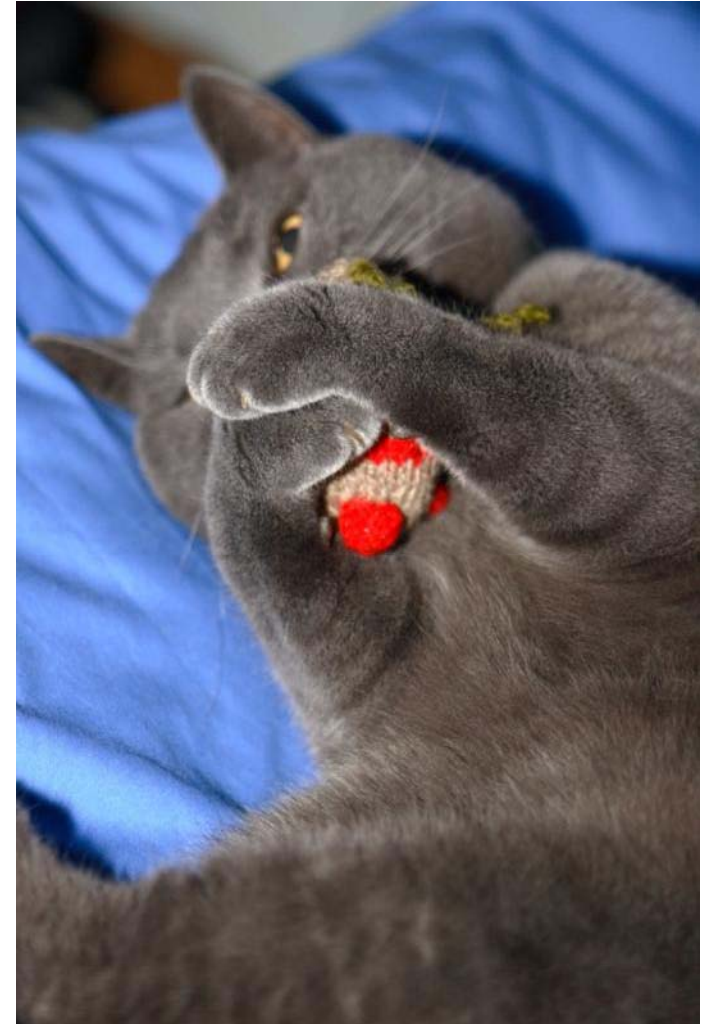
- **Extra functionality in G4MICE:**
  - ◆ "Unforeseen" requirements in MICE running.
    - ⋆ Beam line Simulation
    - ⋆ Non-cylindrical solenoid fields (iron in floor)
  - ◆ Generic accelerator simulation.
  - ◆ Optimisation and robustness

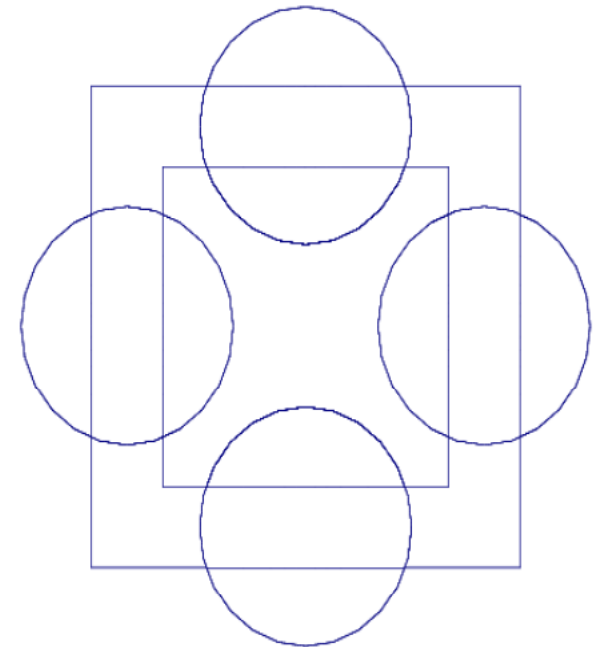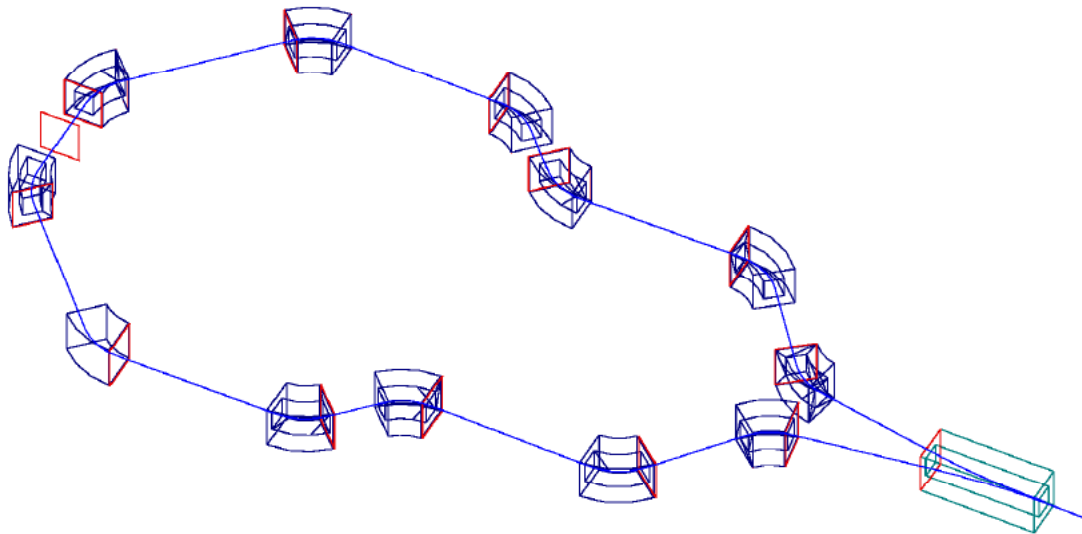- **Any more needs for online/offline analysis???**

# Arbitrary Multipole Field

Multipole Aperture

- Multipole Aperture model implemented
  - Fixed radius of curvature or straight container
  - Arbitrary number of poles for straight multipoles
    - Code is ready for curved poles but bug in G4Torus blocking
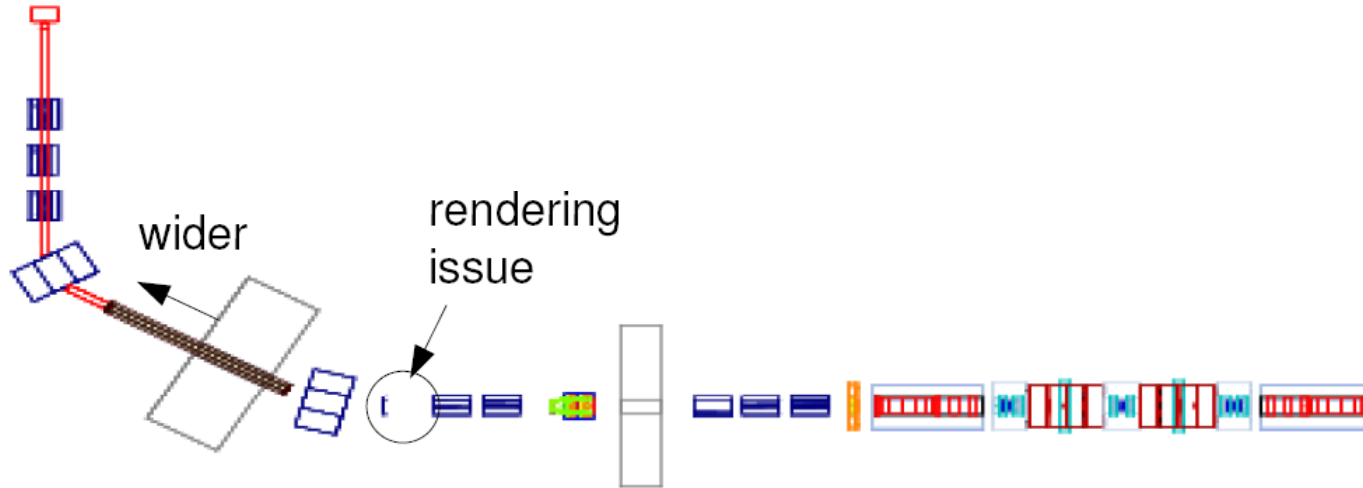   - Fixed in G4.9.1 and I have a patch locally (untested)

Field Map Upgrade

- Mesh::Iterator allows to scan across the mesh and extract field values from the VectorMap without knowing details of Mesh or VectorMap
  - Allows generic set of Read/Write type routines
- Now implementing existing field maps in this framework
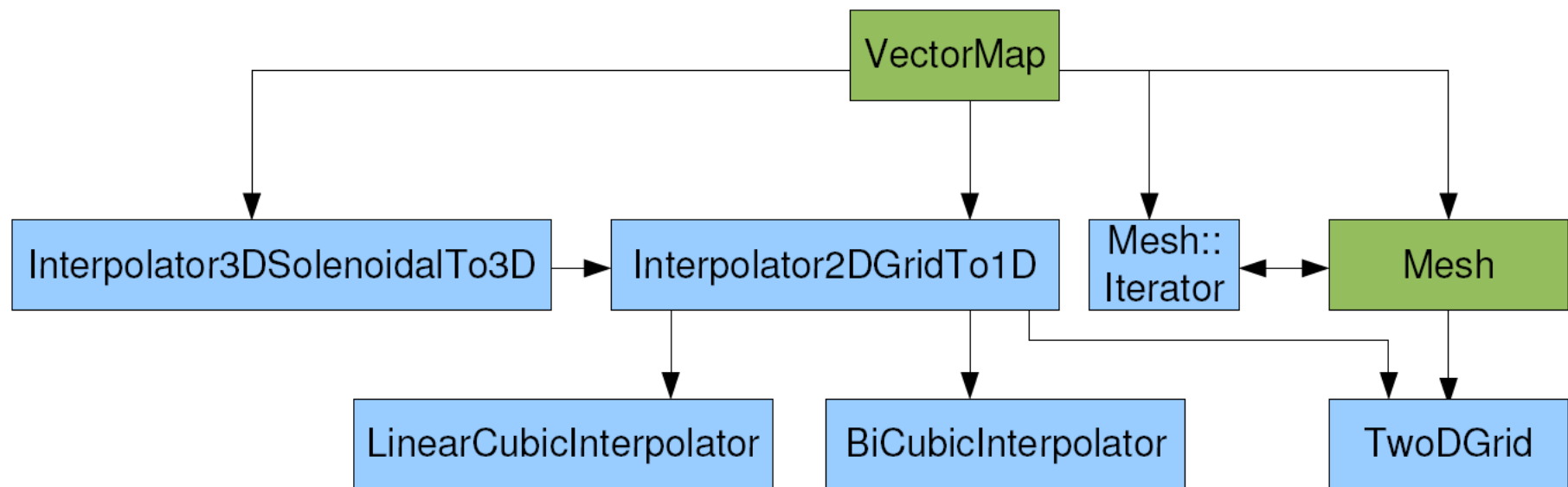
MICE Beam line now in G4MICE

wider

rendering issue

- Full beamline geometry implemented in G4MICE

  - Handles beamline all the way from target to MICE

  - Geometry based on slightly older input file

  - I will update/get worried about details based on survey results (what's actually built!)

  - I show stage 6 but geometry is in place for stage 1-6

P. Kyberd for M. Ellis - CM20 - 12th February 2008

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Analysis / Optics Tools

- **Not enough time in this summary, refer to Chris' talk.**

- **Many powerful analysis and optics tools including histogramming, plotting, scanning and optimisation.**

- **Can read in many different file formats (G4MICE, G4BL, ICOOL)**

- **Transfer maps and covariance matrix optics tools.**
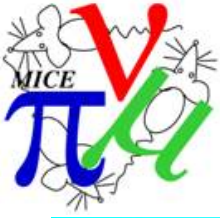
New AFE Firmware

- **In the past week the AFEIIt boards have been readout using the new firmware on both AFE and VLSB boards.**

- **A few bugs are still being ironed out, but the code to unpack this data now exists and is being tested.**

- **Will be imported into G4MICE soon.**

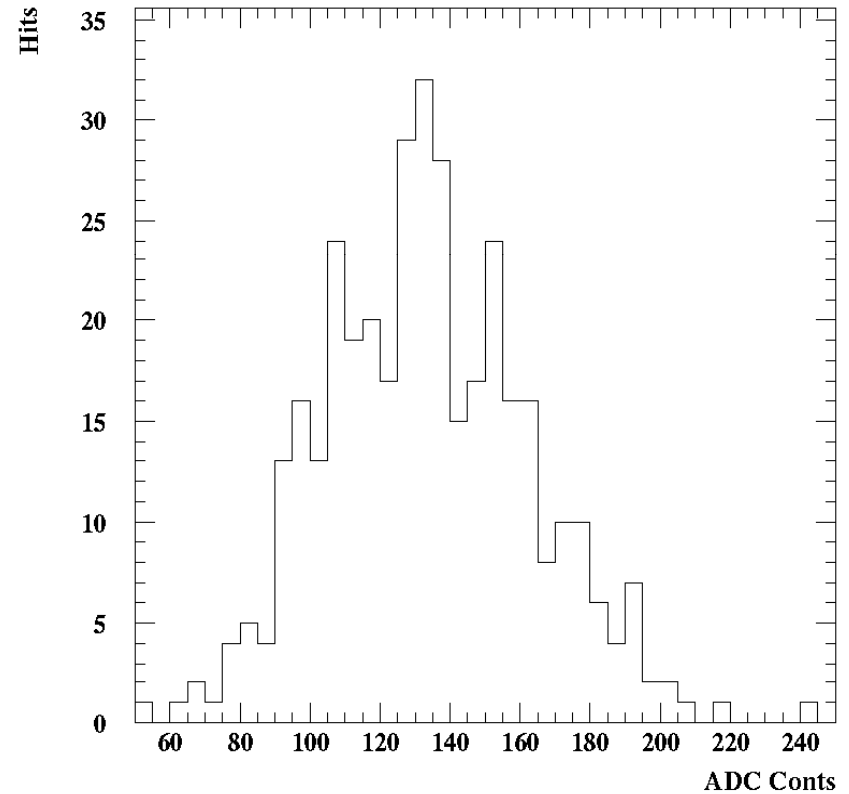# LED Data with the new Firmware

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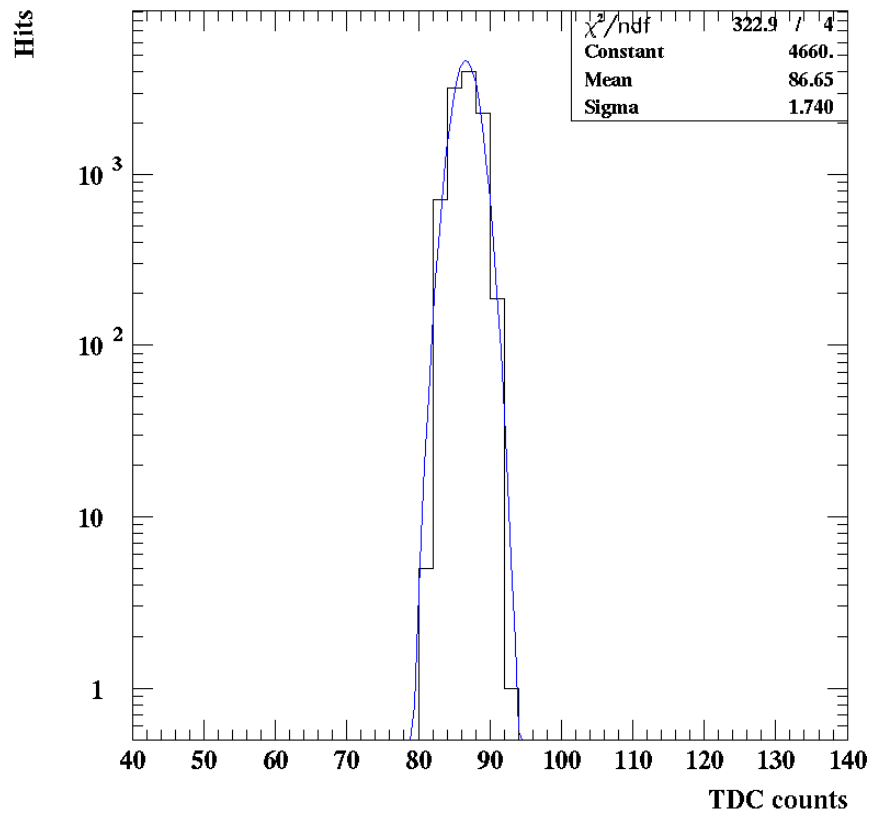
- **MICE VO is now being used for real data analysis and simulation & analysis studies!**

- **G4MICE release 1-9-5 has been installed on 6 CEs, 6 more to go...**
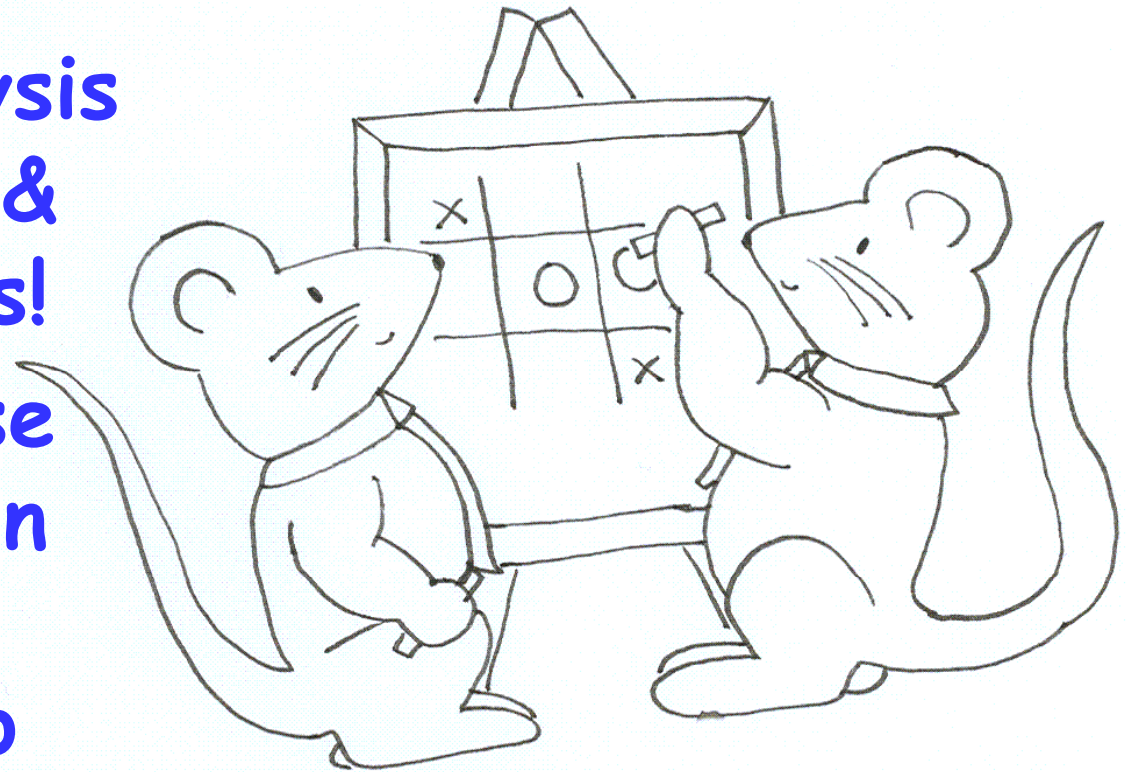
MICE VO Computing Elements

- CE = Computing Element.
- We currently have computing resources provided for MICE by:

  - Brunel
  - Imperial
  - QMUL
  - RHUL
  - Sheffield

  - Liverpool
  - ScotGRID
  - Glasgow
  - Sofia

- A little UK-heavy...

StationQA Analysis

- **To launch the "Data Challenge" I have re-run the analysis of all of the StationQA data from the tracker entirely on the GRID.**

- **The data was transferred to a storage element at Brunel (setup by Henry) and the GRID jobs retrieved the files for each Station and ran the analysis application on them.**

- **Data from 12 Stations (6-17) analysed.**
- **Total of 12,389,135 events processed.**
- **167 of 173 files transferred (6 failures are being investigated).**
- **Total of 233.8 GB data was transferred, unzipped and reconstructed.**
- **Total time from starting first job to end of last job: 4 hours and 6 minutes!**
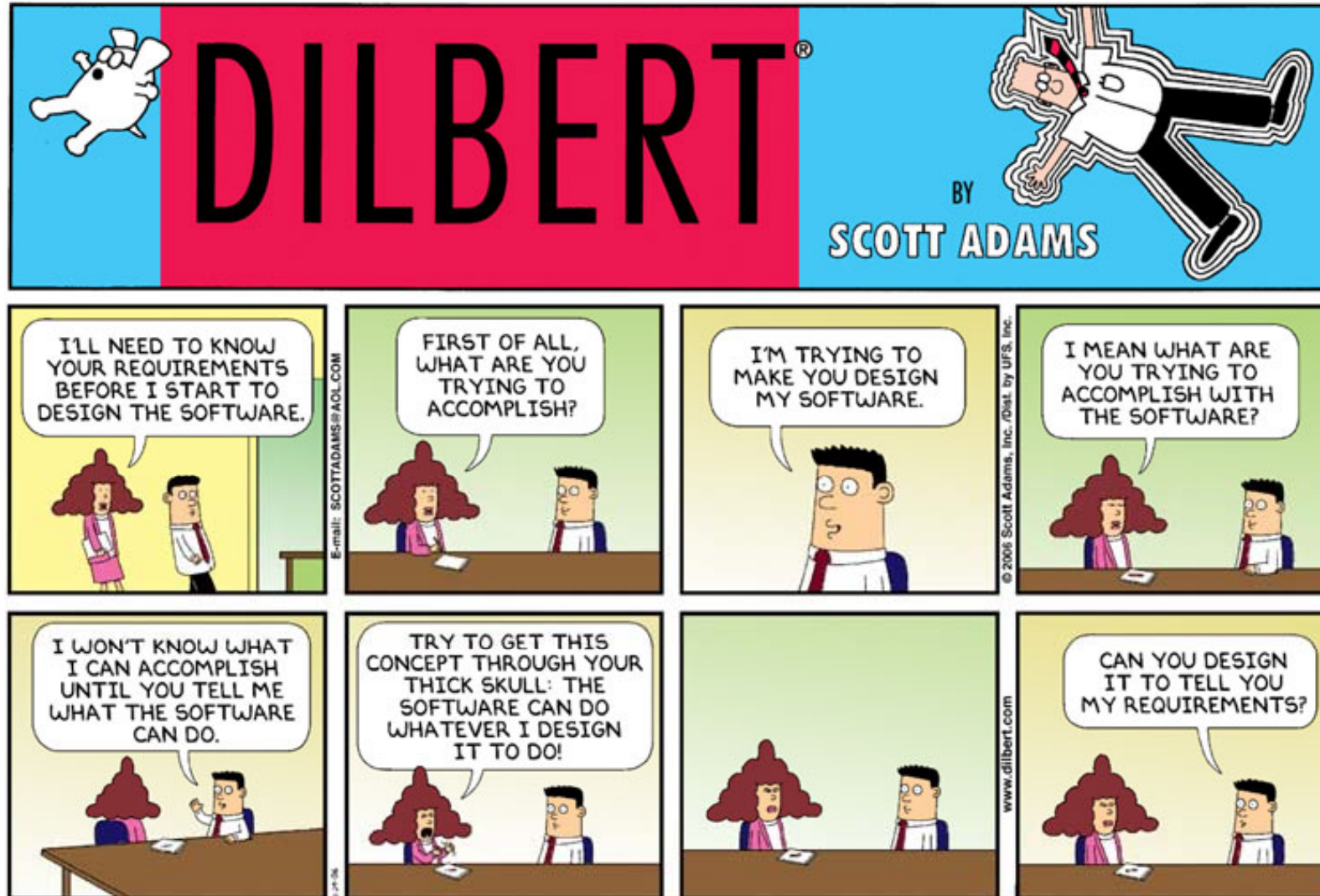
Database – David Forrest

- **DBMS has been chosen: PostGreSQL.**

- **A first list of Use Cases have been generated.**

- **An email request has been made for more (replies due by 20th February).**

- **Important decisions about the way data is handled by DATE, EPICS and the DB need to be made ASAP.**

Database Use Cases

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DATE Readout

- I was supposed to have made progress on this before CM20.

- I have failed.

- JSG has provided me with more recent code and some example data files for testing.

- I will push harder to get a first version working by the end of this month.

EPICS Readout

- **I have recently made contact with Brian Martlew and will start the process of designing and implementing the G4MICE interfaces to the EPICS data in the coming month.**

- **Software Review to be scheduled for April or May.**

- **Several ideas for reviewers, aim to finalise this soon.**

- **In preparation for review, will work hard on updating the documentation which is patchy and ranges from quite good in some areas to non-existent in others.**

Software Schools

- **I am organising two software schools to serve as an introduction to C/C++ in the G4MICE environment.**

- **One 3 day school will be held at Fermilab just before the NFMCC meeting in March. (To be announced soon!).**

- **The other will be held at RAL at a date to be determined.**

Summary

- **Software team continuing to make good progress, but the clock is still ticking.**

- **We are very grateful for the efforts of our new developers David Forrest and Mark Rayner.**

- **Other items of software not covered in software session, but can be found in the analysis session.**

- **We will continue to work as hard as possible to meet the challenges of imminent beam and data taking.**