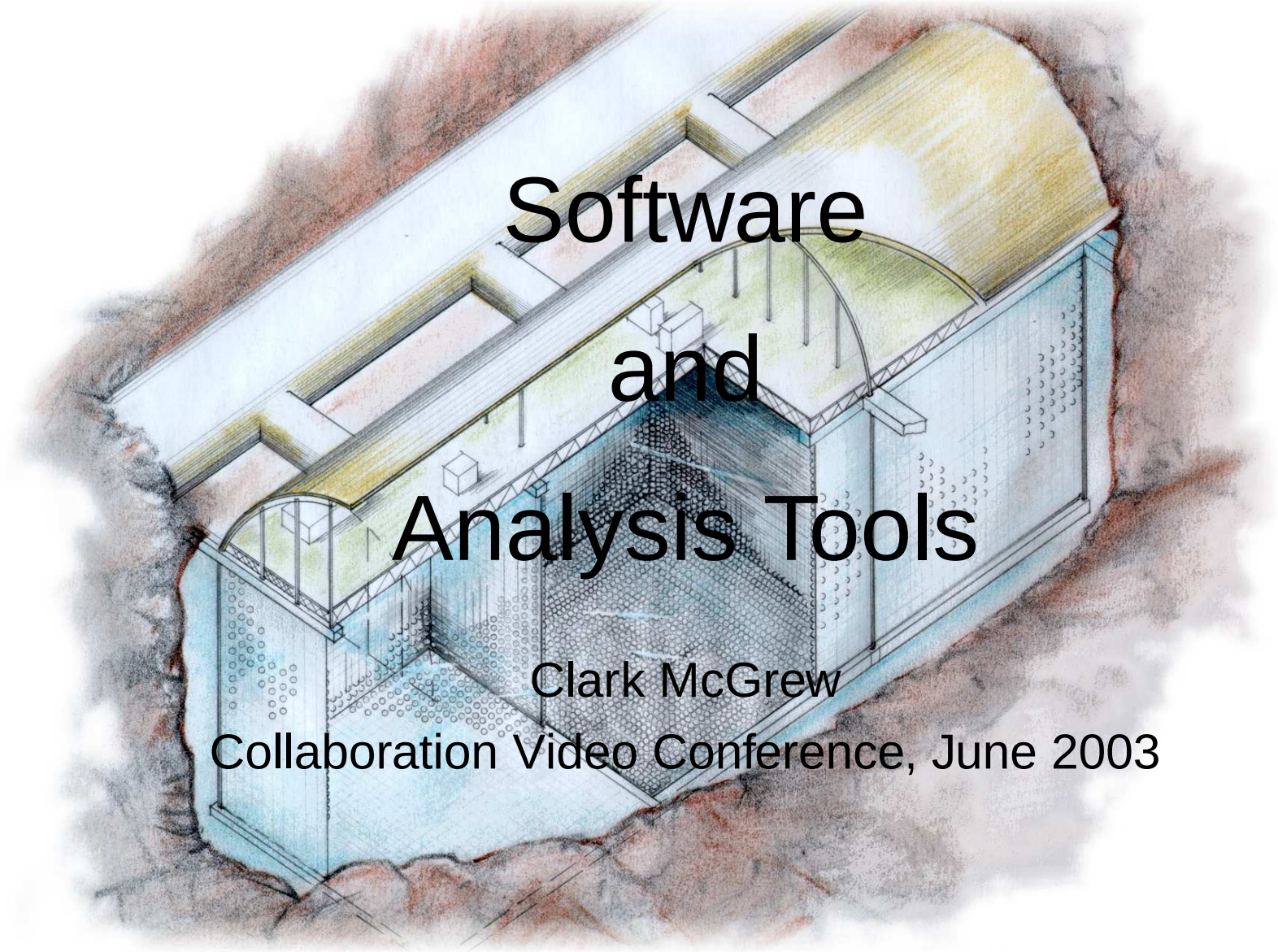
UNO



Software and Analysis Tools

Clark McGrew

Collaboration Video Conference, June 2003

Available Tools

- A GEANT4 detector MC.
  - UNO Straw-man detector
  - SK-I (buggy, but ran once)
  - Kamiokande (code is there, but not tested)
  - IMB-III (i.e. a one module UNO).
- Support code to read and write events.
- An Event Display.
  - Currently used to debug MC and Support Code.
  - Will become a presentation tool.
- Suffering Bit-Rot
  - Simple electronics simulations (ATM, FADC)
  - Event Reconstruction (a.k.a. AFIT, &c)

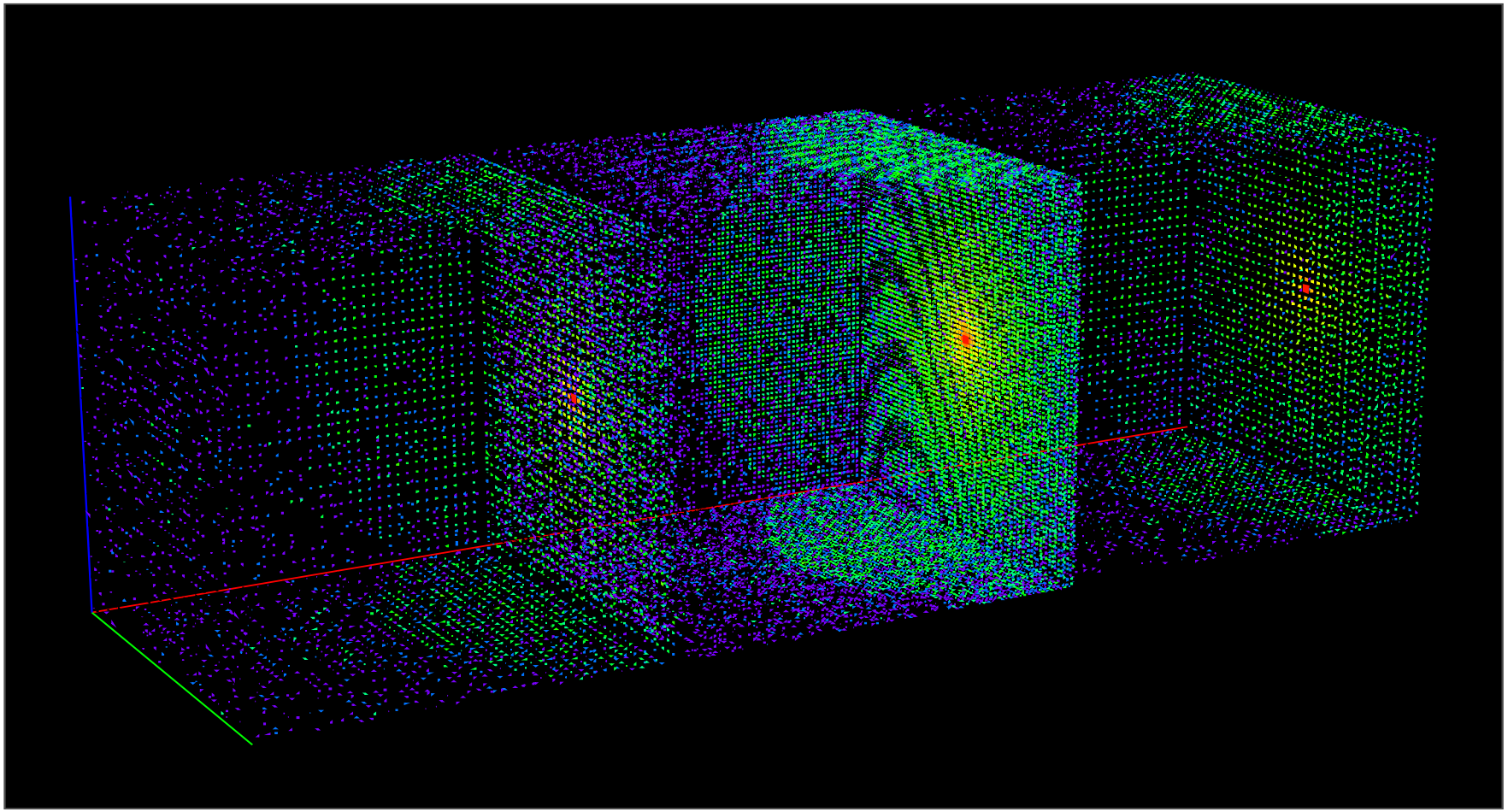
CSIM: The Event Simulator

Very Flexible Geometry

- Specify geometry from input file:
  - Detector Shape: Cubic, or Cylindrical
    - Simulates detectors with regular PMT grids: UNO, SK-I, K2K 1 kton, Kamiokande, IMB
    - Cylindrical geometry is not well tested.
  - Number of modules (i.e. 3 for UNO)
  - PMT characteristics in each module
    - PMT size
    - PMT spacing
    - PMT timing and efficiency

Currently accepts input from NUANCE.

The UNO Event Display



300 GeV Muon along X axis.

Tasks required before proposal

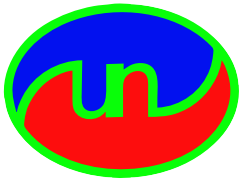
Required for physics studies using specific UNO geometries.

1. Match MC to published SK-I response (tuning required)
   - Verify SK-I geometry
   - Energy Response
   - Light Attenuation
   - Light Scattering
2. Verify electronics simulation (already exists)
   - FADC
   - ATM
3. Update event reconstruction (already exists)
   - Routines based on SK-I
   - Verify against published resolutions

Third-party Tools

- To compile and develop analysis code:
  - CMT – Keep track of package versions and dependencies
  - CVS – Used by CMT to keep track of individual file versions
  - ROOT – The new CERNLIB, complete with Rene Brun
- Additionally To run the MC:
  - GEANT4 – The new GEANT
  - CLHEP – Required by GEANT

Contact Information



- Web:
  - Documentation: <http://nngroup.physics.sunysb.edu/∼pdk/>
  - Browsable CVS Repository: <http://nngroup.physics.sunysb.edu/cgi-bin/viewcvs.cgi/>
- CVS Repository: <:ext:pdk@ale.physics.sunysb.edu:/u/ale/pdk/Repository>