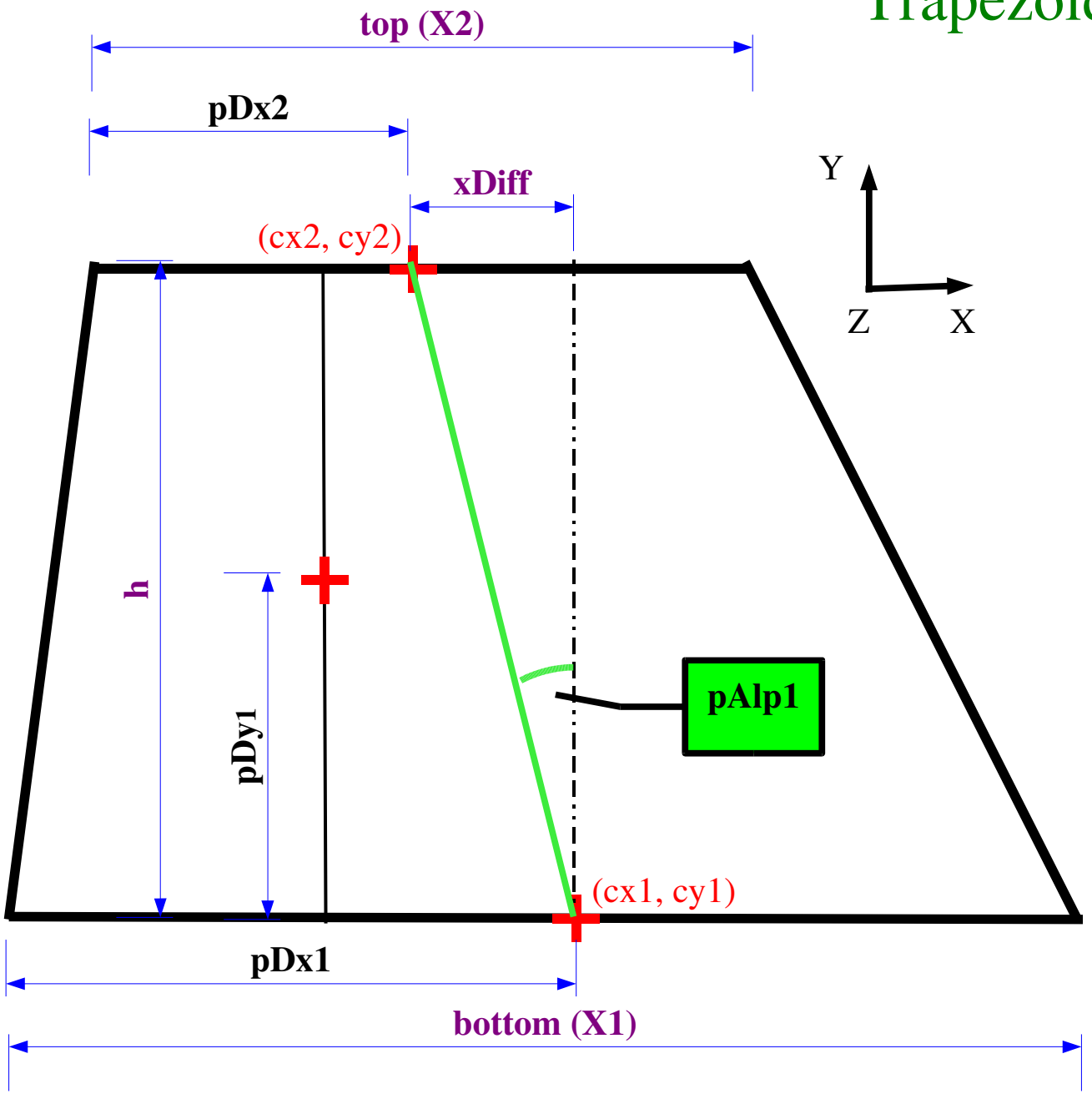
Trapezoids

- Modeling volume shape
- Rotations
- Display
- Interactions with ACD code
- Status

Trapezoidal Prism Parametrized



pDx1 = ½ **bottom** edge

pDx2 = ½ **top** edge

pDy1 = ½ **h**

pAlp1 = atan(**xDiff/h**)

xDiff = cx2 – cx1

pDz = ½ **thickness**

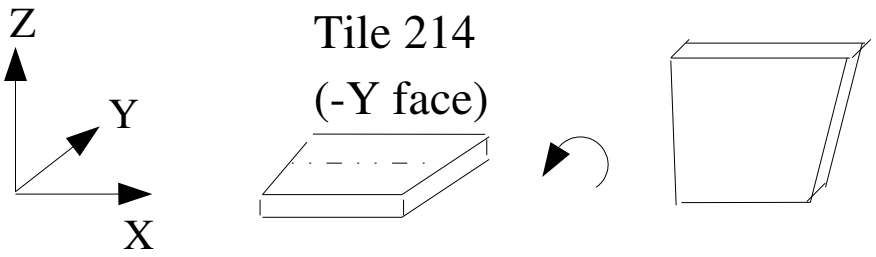
Bold black <--> G4Trap parameter

Bold magenta <--> gdd parameter

Rotations

- Versions of xmlGeoDbs prior to v1r46 defined side tiles so that no rotations were necessary; i.e., local coordinate system = LAT global coord.
- G4 trapezoidal solids have a canonical orientation: Z is thickness, Y is height of trapezoid.
- ==> All trapezoidal tiles must be rotated. Easiest to just rotate all side tiles.

Rotations (2)

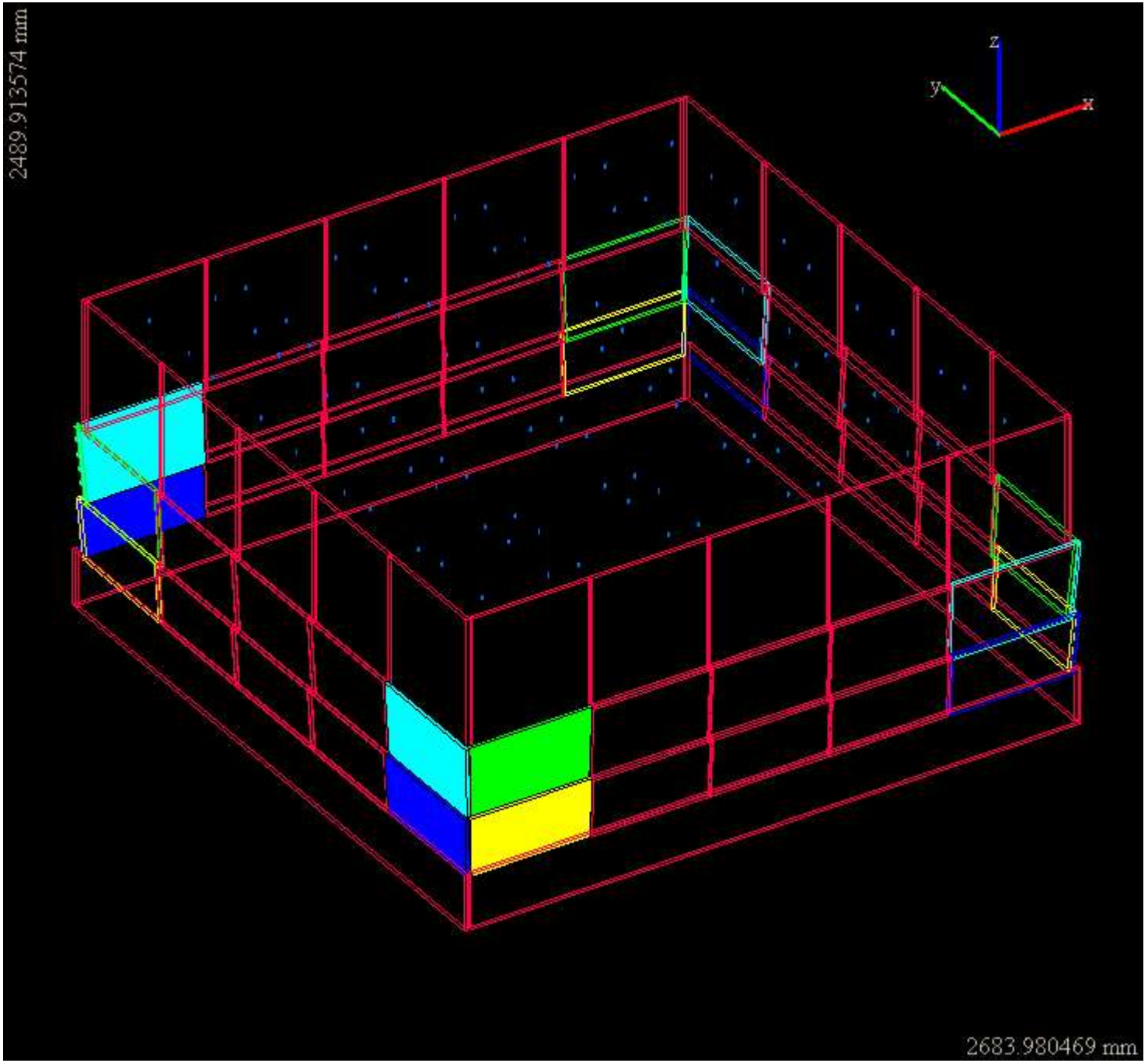


Local coords

LAT coords achieved by
rotating (90 + row 1 slant) about X

For other faces, rotation about X is followed by one about Z.

This appears to be working correctly as displayed by Fred. Don't yet know about G4.
We still need a way to display geometry directly from Geant!


2489.913574 mm
z
y
x
2683.980469 mm

Acd Code & Geometry

- There is no feasible automatic way for ACD code to handle all these changes, but we could do better
  - Auxilliary xml file in xmlGeoDbs pkg, to be read by AcdUtil
  - Per-subsystem version info in geometry description
- In the meantime, must be careful to build releases with compatible pkg versions.

Status

- Trapezoids are in geometry description and fully supported as of GR LATEST-1.3441
  - In Fred display
  - In generation of G4 geometry
  - In ACD code, thanks to Eric C.
- but the last two are entirely untested.