Phase II Geometry

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Goal

Design Phase II System Test detector geometries for use in simulations.

Plan

1. Study Phase I and LZ geometries
2. Design simplified geometry
3. Increase complexity of geometry
   a. Add optical surfaces
   b. Add PMT's
   c. Other features
4. Work towards final Phase II geometry
   a. More components, most realistic
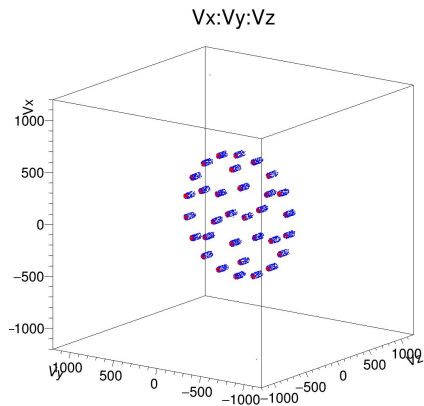5. Work on macros for Phase II
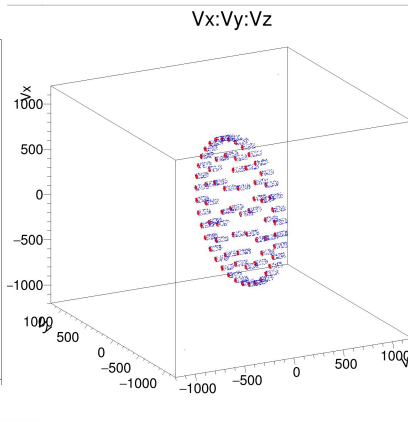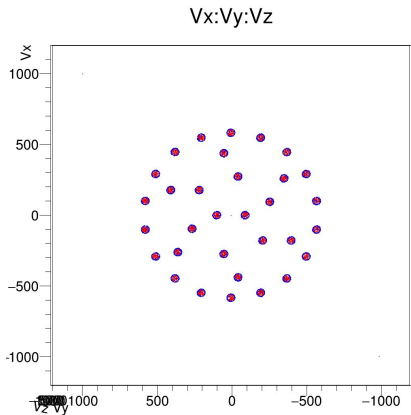
Done Last Week:

- Added R8778 PMT from LUX
- Implemented inner and outer arrays
- Modified geometry to match Rachel's
  - Updated parameters file
  - Added AlMgF2 coated reflective Wall
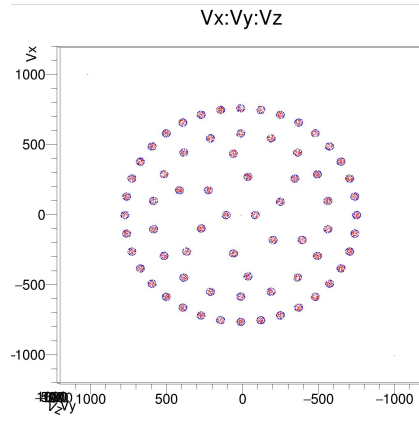 - Grid (still need to code and implement)

R8778 PMT Arrays

Blue is steel PMT body, red is PMT window

Inner array

Inner + Outer array

Next Steps

- Finish modifying geometry for optical simulations
  - Repurpose LZGrid.cc code
- Start optical simulations in comparison to Rachel's LightGuide sims

Backup Slides

AlMgF2

Accessed with: CoatingAlMgF2(),   GXeAlMgF2Surface()

- Defines a new material with many of the same properties of Aluminum but with reflectivity of AlMgF2 (approximation)
- Defines AlMgF2 MaterialPropertiesTable   (followed format of Teflon)
  - **Reflectivity = .88**
  - **Specular lobe constant = 0**
  - **Specular spike constant = 0**
  - **Backscatter constant = 0**
  - **Efficiency = 1**
- Creates a boundary surface for the gas Xe - AlMgF2 interface with above properties

Any other suggestions for improvement?

2 Component Visualization
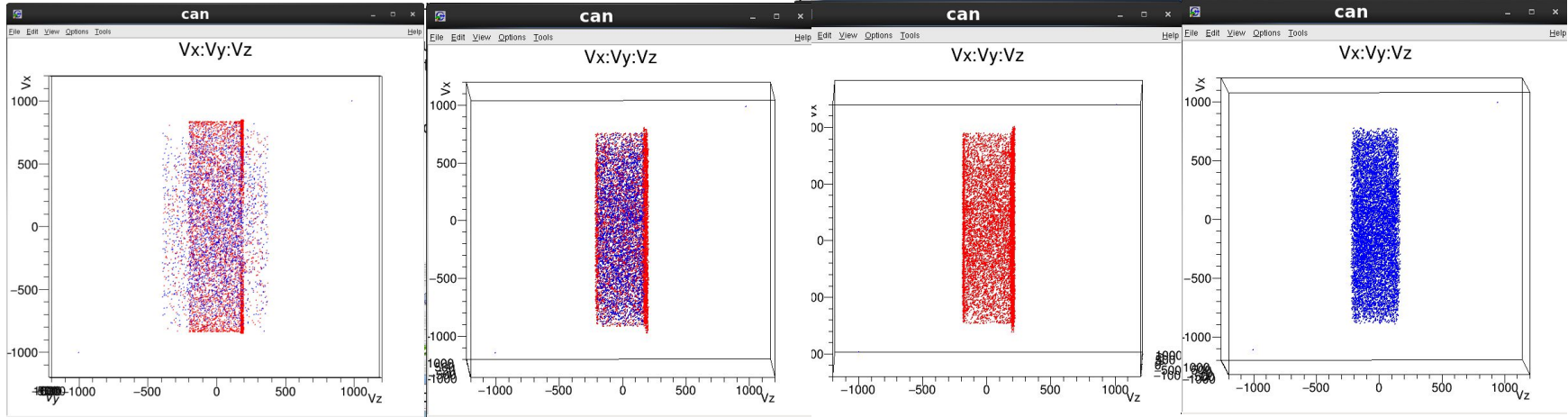
Both (before)   Both (after)   GXe space (after)   IV (after)

- All particles accounted for and within defined geometry

- Error caused by overlap in geometry dimensions

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