

## MAUS - Feature #1567

### Volume plot in geometry validation

16 October 2014 09:43 - Rogers, Chris

<b>Status:</b>	Closed	<b>Start date:</b>	16 October 2014
<b>Priority:</b>	Normal	<b>Due date:</b>	
<b>Assignee:</b>	Rogers, Chris	<b>% Done:</b>	100%
<b>Category:</b>	Geometry	<b>Estimated time:</b>	0.00 hour
<b>Target version:</b>	Future MAUS release		
<b>Workflow:</b>	New Issue		
<b>Description</b>			
Additional validation required following geometry workshop.			
<b>Related issues:</b>			
Related to MAUS - Feature #1553: Geometry Comparison		<b>Closed</b>	<b>30 September 2014</b>

### History

#### #1 - 16 October 2014 09:47 - Rogers, Chris

- Category set to Geometry
- Assignee set to Rogers, Chris
- Target version set to Future MAUS release

Require to:

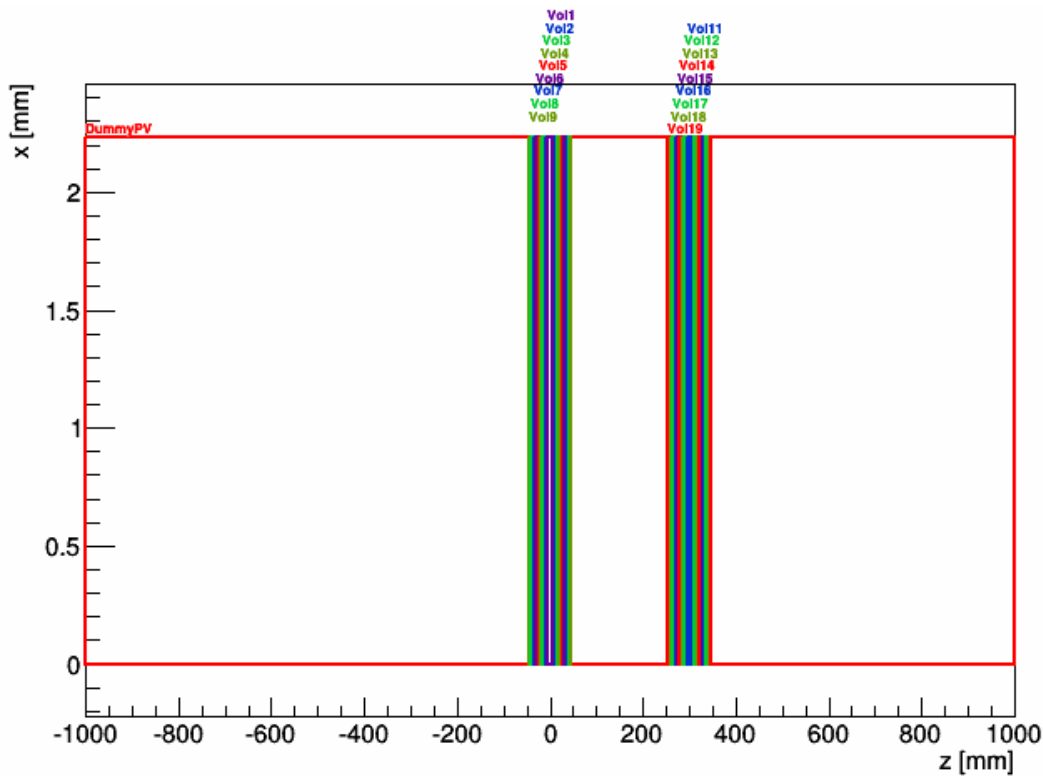
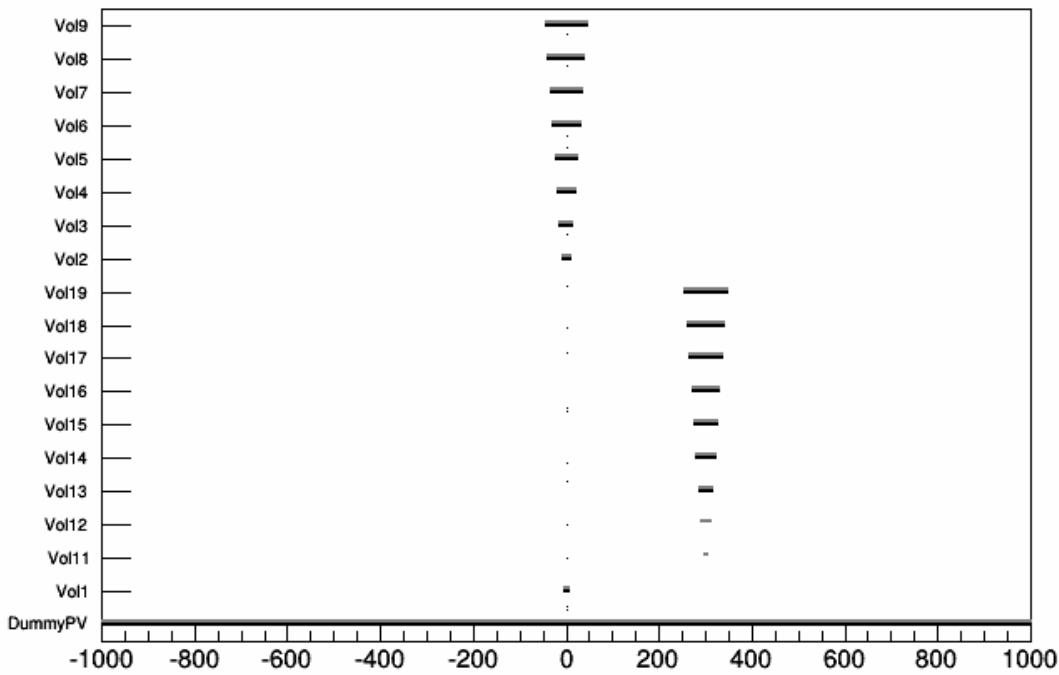
- plot 2d rectangular bounding boxes that encompass all steps in the tracking output with a particular volume name; label with volume name and material
- plot 1d on-axis volume map; Label with volume name
- look at differences between two geometries (not quite sure yet how best to do this, will think)

#### #2 - 17 October 2014 07:59 - Rogers, Chris

- File `test_geometry_validation_volumes_1d.png` added
- File `test_geometry_validation_volumes_2d.png` added
- File `test_geometry_validation_volumes.json` added

I implemented the plots as per request, sample output (from integration test) is attached. Note that in the 1D plot, two lines are apparent - the grey line is the volume extent in z at all points, the black line is the volume extent in z on-axis. For the 2D plot, note the coloured rectangles are "bounding boxes" in z and r, i.e. I calculate the smallest possible rectangle that can encompass all points and plot this. Doing a "convex hull" or similar is quite difficult and beyond the scope of this feature.

## Volume Name vs z



For the "diff"ing of two geometries, I made a volume bounding box json output file. User then has to manually inspect the output file for differences (well more likely they would make a script). This works as long as the CAD import has stable *volume names* for **this** version or **that** version. I attach a sample output, format is something like:

```
{
  <string volume name>: {
    "z_min": <float minimum z of steps in volume>,
    "z_max": <float maximum z of steps in volume>,
    "r_min": <float minimum radius of steps in volume>,
    "r_max": <float maximum radius of steps in volume>,
    "material": <string material name>
  },
  ...
}
```

e.g.

```
"Vol14": {
  "z_max": 320.0,
  "r_min": 0.0,
  "material": "G4_Al",
  "r_max": 2.23606806280132,
  "z_min": 280.0
},
...
```

I will run it through test and if it goes smoothly commit later today.

### #3 - 17 October 2014 15:13 - Rogers, Chris

Changes were committed in r784

### #4 - 17 October 2014 17:37 - Rogers, Chris

- Status changed from Open to Closed

- % Done changed from 0 to 100

### Files

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test_geometry_validation_volumes_1d.png	9.51 KB	17 October 2014	Rogers, Chris
test_geometry_validation_volumes_2d.png	8.31 KB	17 October 2014	Rogers, Chris
test_geometry_validation_volumes.json	2.56 KB	17 October 2014	Rogers, Chris