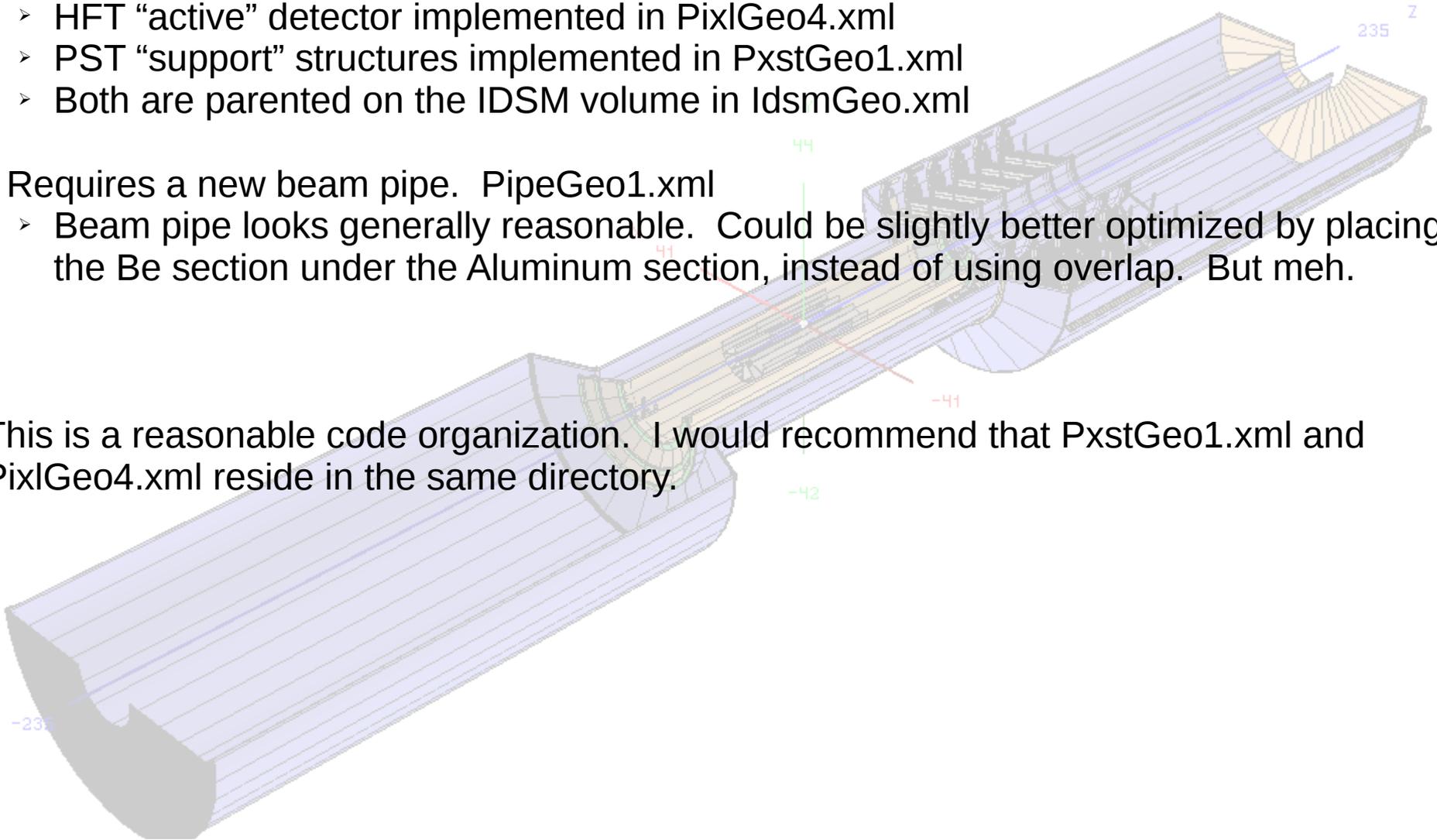- The Geometry is implemented into two modules

  - HFT "active" detector implemented in PixlGeo4.xml
  - PST "support" structures implemented in PxstGeo1.xml
  - Both are parented on the IDSM volume in IdsmGeo.xml

- Requires a new beam pipe. PipeGeo1.xml
  - Beam pipe looks generally reasonable. Could be slightly better optimized by placing the Be section under the Aluminum section, instead of using overlap. But meh.

This is a reasonable code organization. I would recommend that PxstGeo1.xml and PixlGeo4.xml reside in the same directory.

```
<Volume name="PLAC" comment="active silicon top sector"  >
  <Material name="Sensitive" isvol="1"/>
  <Attribute for="PLAC" seen="1" colo="6"  />
  <Material name="Silicon"  />
  <Shape type="BOX" dz="HalfPixZ" dx="HalfPixR" dy="HalfPixThk" />
  ....
</Volume>
```
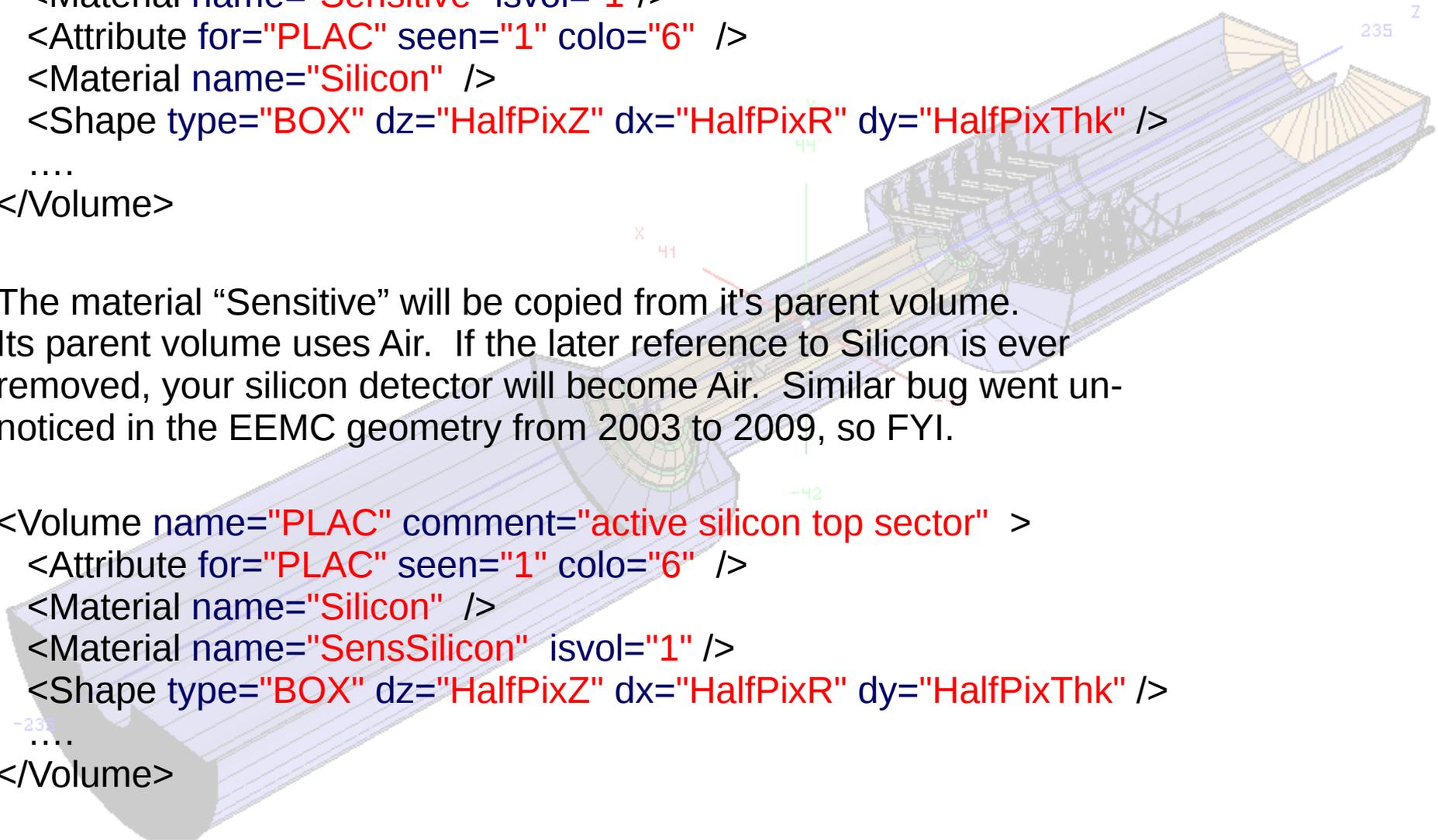
The material "Sensitive" will be copied from it's parent volume.
Its parent volume uses Air. If the later reference to Silicon is ever
removed, your silicon detector will become Air. Similar bug went un-
noticed in the EEMC geometry from 2003 to 2009, so FYI.

```
<Volume name="PLAC" comment="active silicon top sector"  >
  <Attribute for="PLAC" seen="1" colo="6"  />
  <Material name="Silicon"  />
  <Material name="SensSilicon"  isvol="1" />
  <Shape type="BOX" dz="HalfPixZ" dx="HalfPixR" dy="HalfPixThk" />
  ....
</Volume>
```

```
<varlist type="float" comment=" rmin for top arc " > ArcTMin/0.123/</varlist>
<varlist type="float" comment=" rmax for top arc " > ArcTMax/0.15/</varlist>

....

<varlist type="float" comment=" glue layer C half length in Z" >     HalfPixZGC/15.325/</varlist>
<varlist type="float" comment=" offset in Z of the PXL w.r.t the center of STAR" >GlobOffZ/-5.015/</varlist>
```
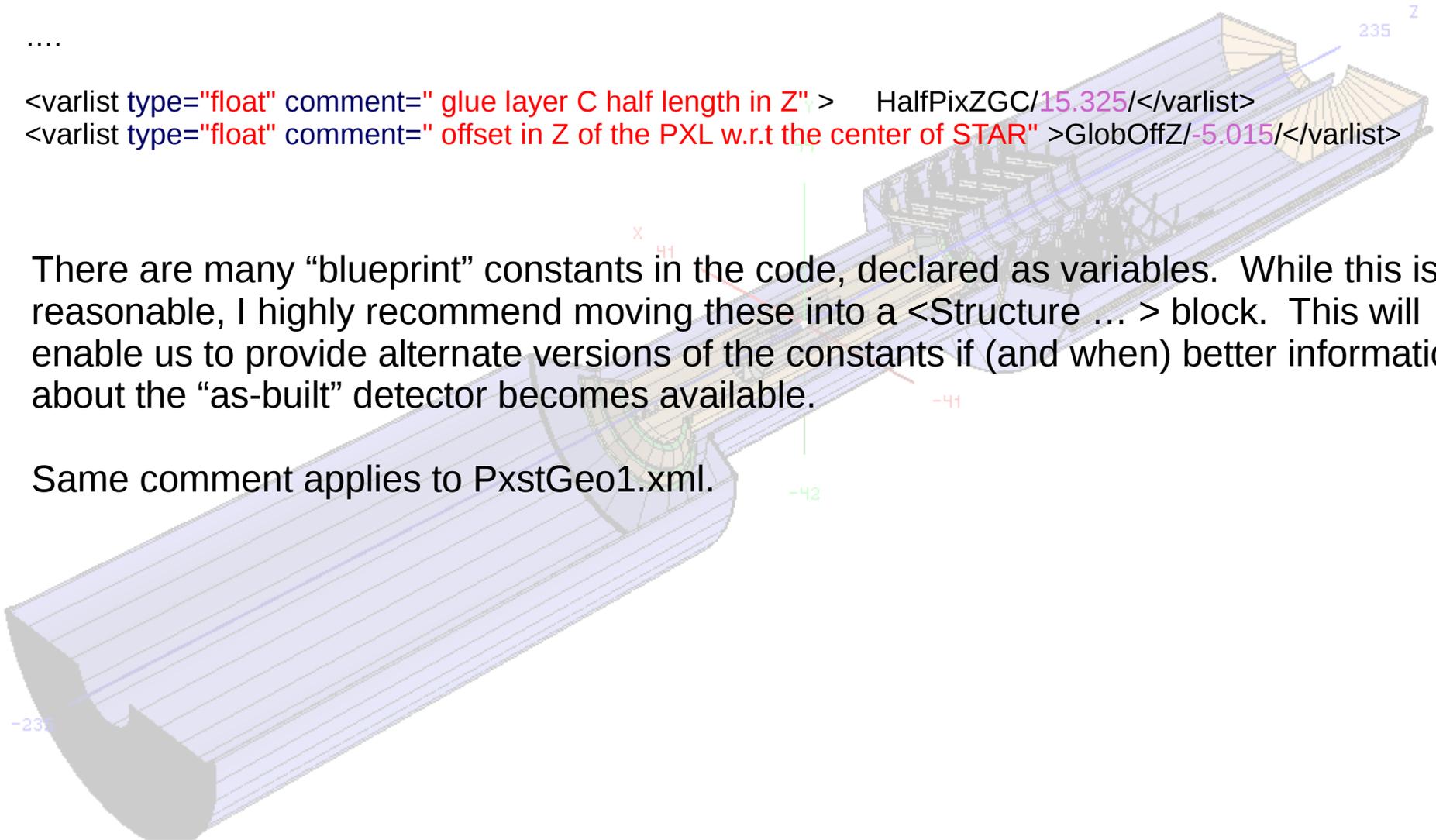
There are many "blueprint" constants in the code, declared as variables. While this is reasonable, I highly recommend moving these into a <Structure … > block. This will enable us to provide alternate versions of the constants if (and when) better information about the "as-built" detector becomes available.
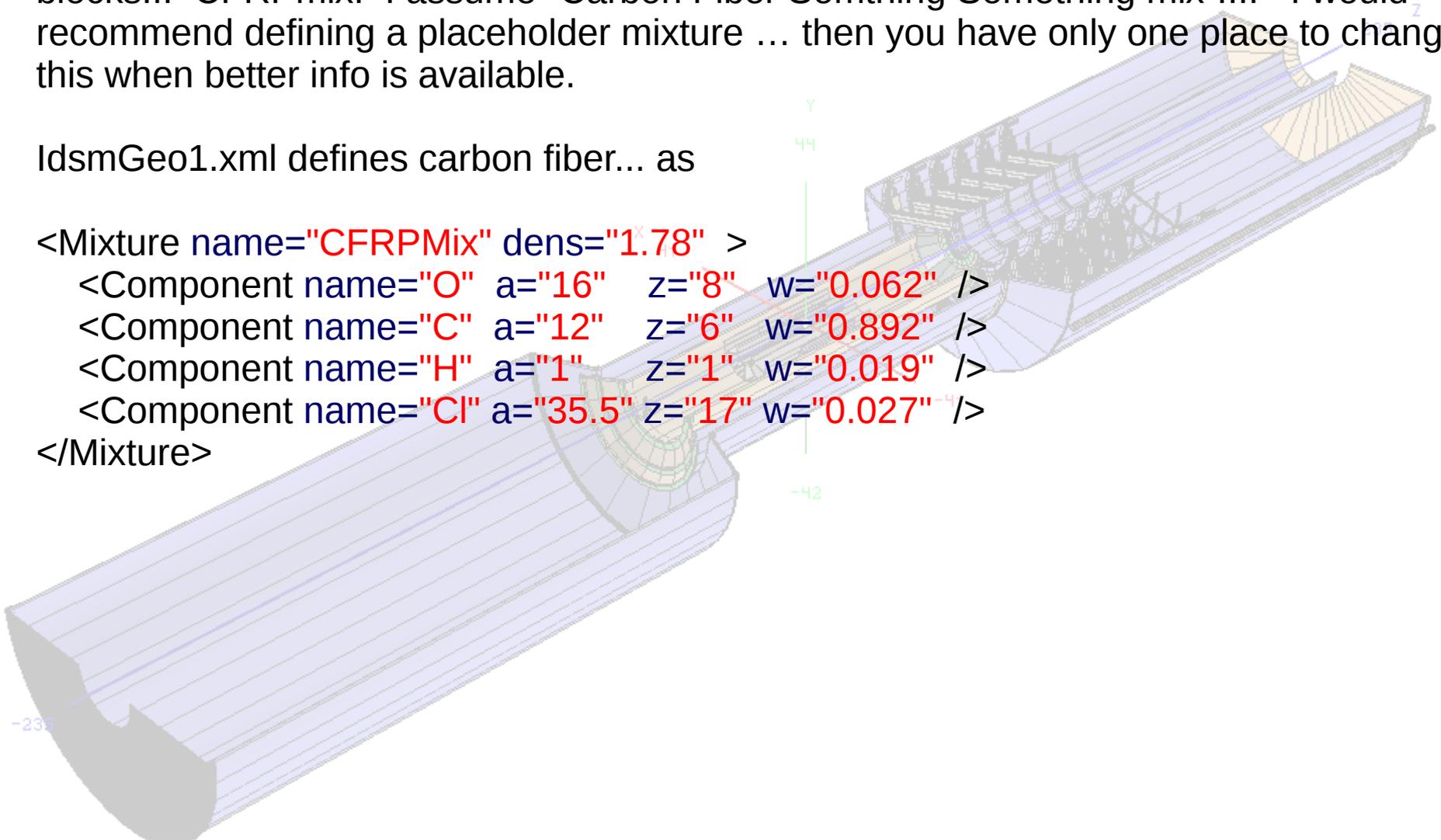
Same comment applies to PxstGeo1.xml.

There are many-many-many instances of a single material being declared in several blocks... CFRPmix. I assume "Carbon Fiber Somthing Something mix".... I would recommend defining a placeholder mixture … then you have only one place to change this when better info is available.

IdsmGeo1.xml defines carbon fiber... as

```
<Mixture name="CFRPMix" dens="1.78"  >
   <Component name="O"  a="16"   z="8"   w="0.062"  />
   <Component name="C"  a="12"   z="6"   w="0.892"  />
   <Component name="H"  a="1"    z="1"   w="0.019"  />
   <Component name="Cl" a="35.5" z="17" w="0.027"  />
</Mixture>
```

- Some consideration for misalignment should be made, as it relates to the organization of the detector in the geometry tree. The PST and HFT will move in (and out) as a unit. So a translation or rotation of the pixel detectors may indicate a translation/rotation of the support as well

- Currently the PXMO (pixel detector mother) and PXST (pixel support) are inserted into the IDSM. If they were instead inserted into a common mother volume, then they could be misaligned as a unit. Knowledge of the alignment of one could be applied to both.

- Alternatively, the misalignment framework could handle this by adding an assembly into which both PXMO and PXST could be inserted.

- At present, there is no configuration of the PXMO and PXST which place the detector in the "OUT" position... where does everything sit when it is removed from STAR? Is it completely removed from the wide angle hall, or does it end up (potentially) shadowing detectors on the east side of STAR?