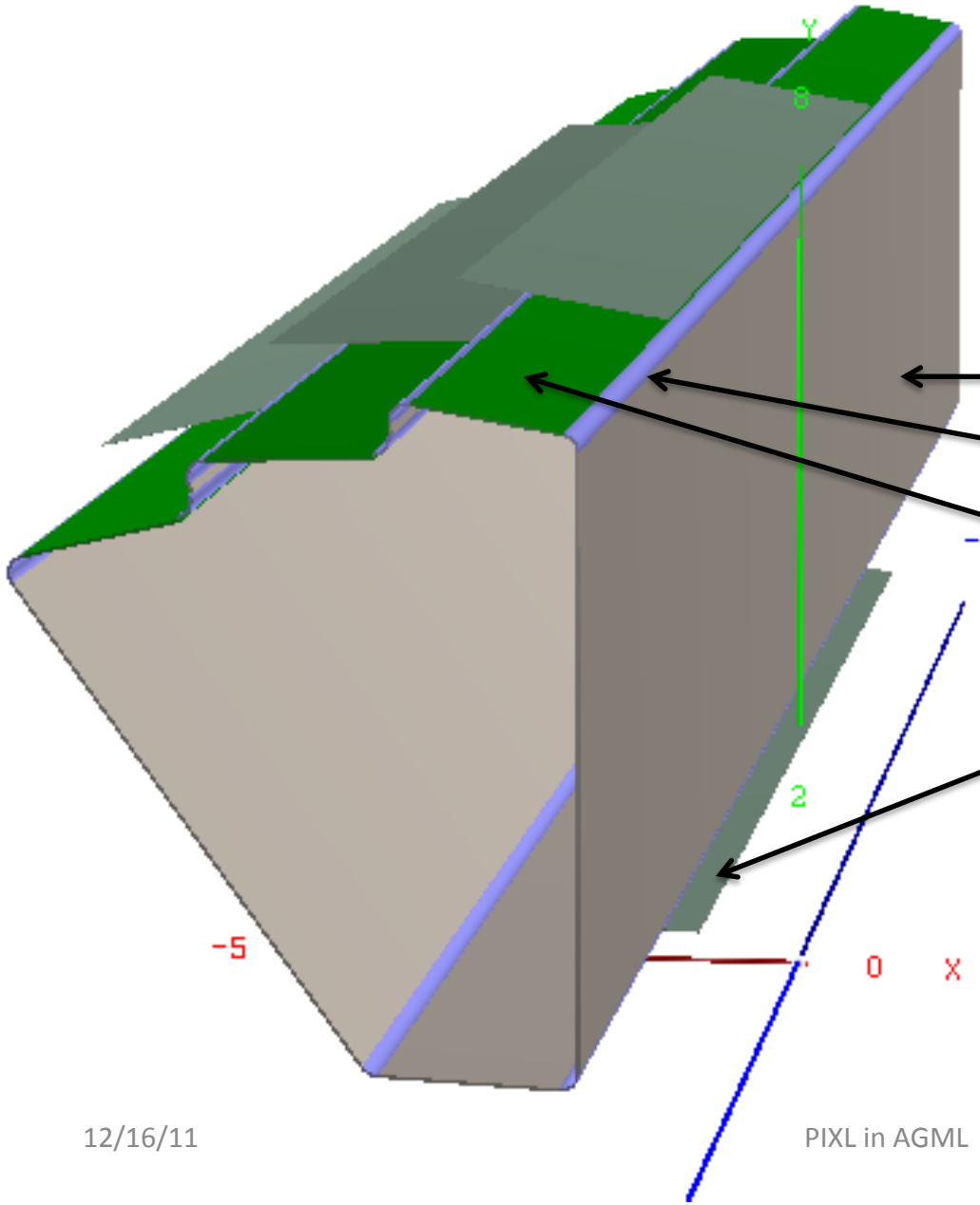
AGML geometry for PIXL

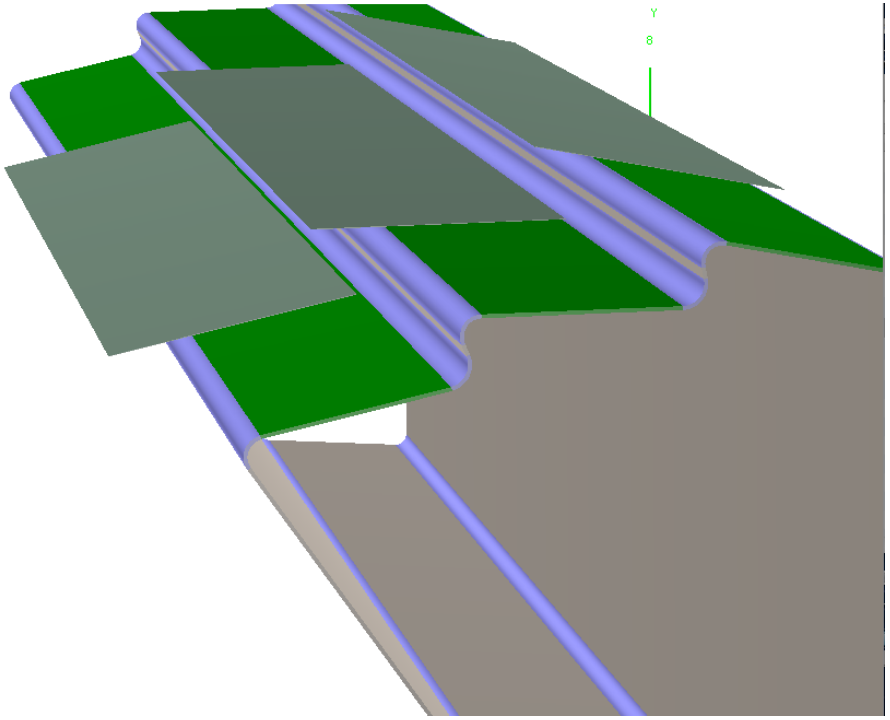
- Use Flemming's numbers (translation of SolideWorks Geometry ←→ TGeo) to implement the geometry in AGML
  1. a single sector : 4 active pixels ladders + mount structure
  2. Duplicate the single sector (x10) and place it into the IDSM
  3. Check for overlaps
  4. Materials
- Next steps

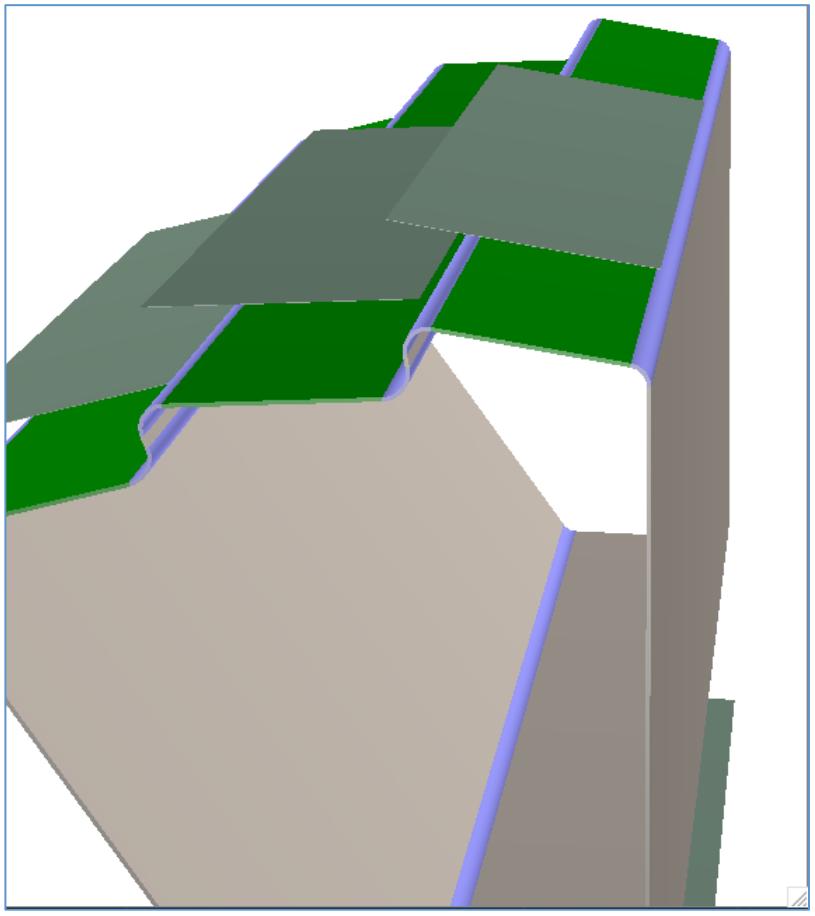
A single pixl sector



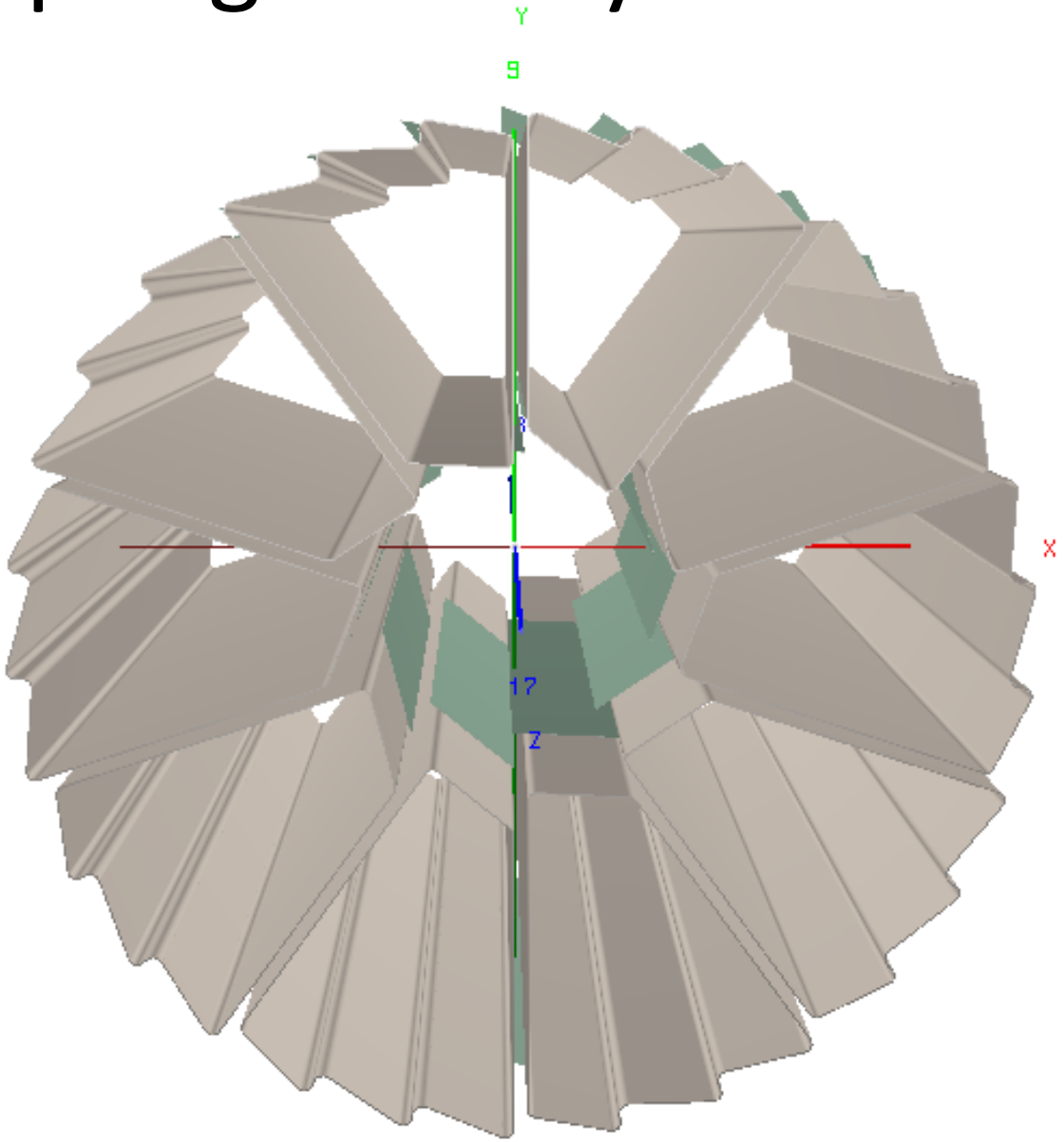
Colors are only to distinguish GEANT shapes :

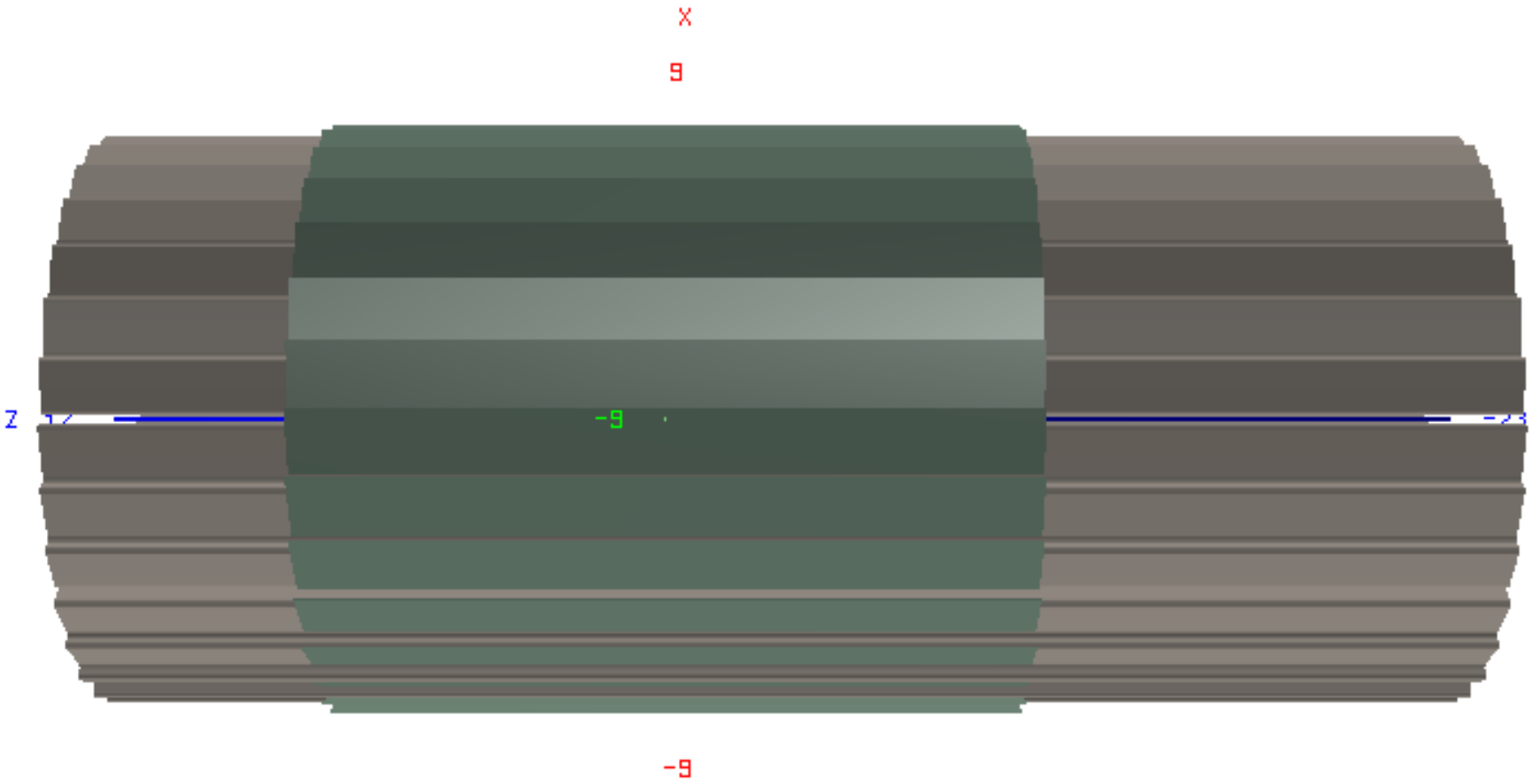
- brown : BOX
- Purple : TUBS
- green : BOX for the top of the sector
- Dark green (top and bottom) : BOX for silicon active wafer

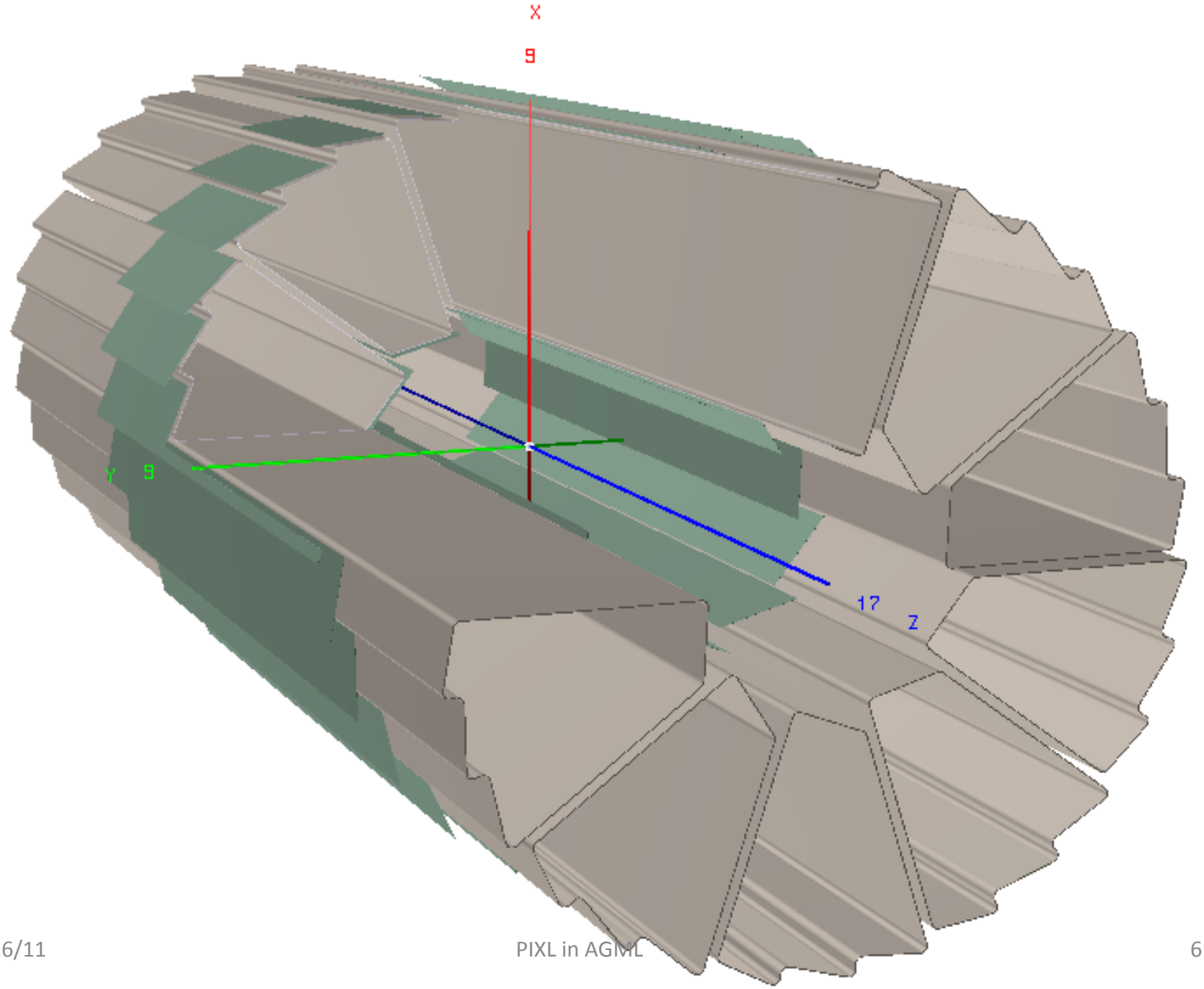




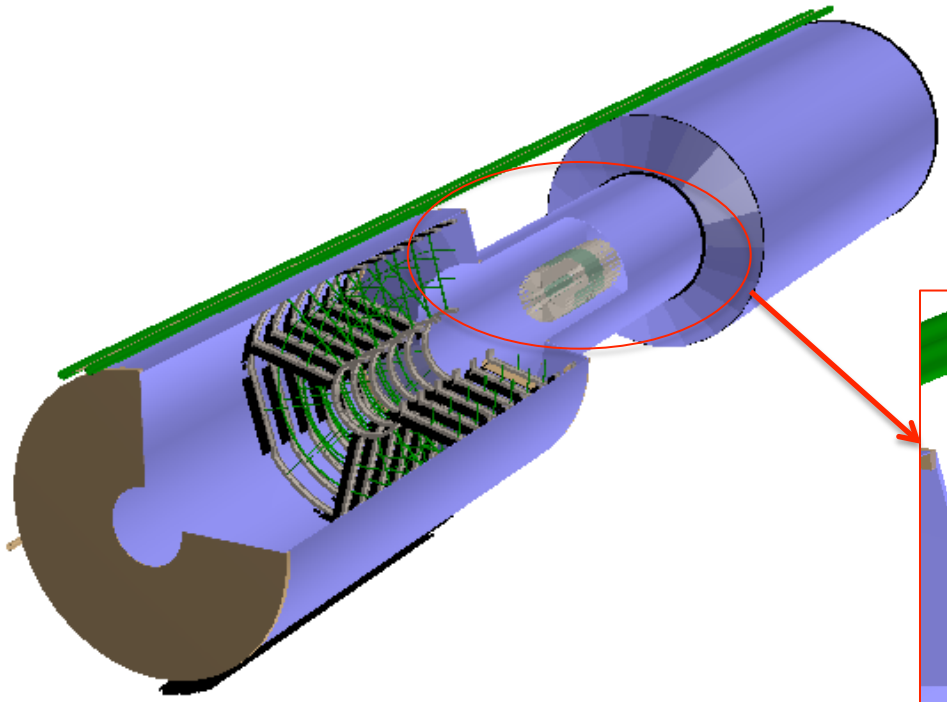
Full pixl geometry : 10 sectors

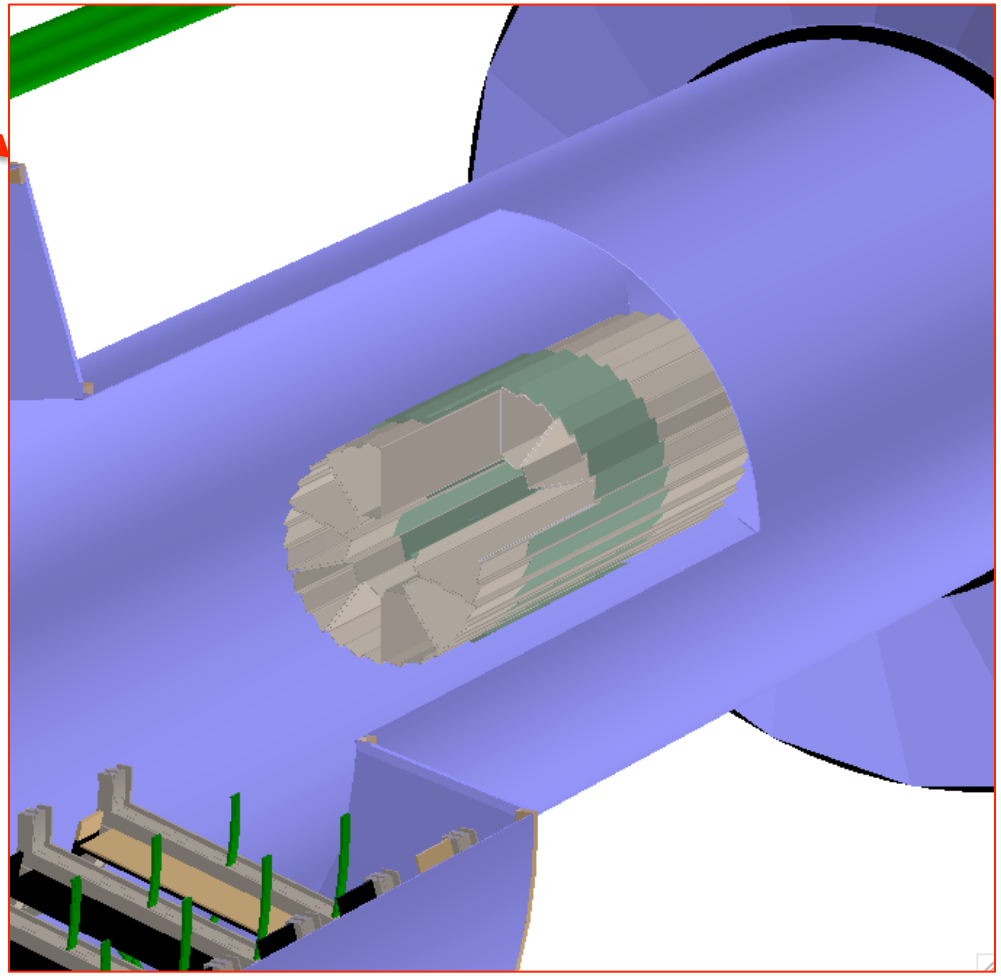



X
9
Z
-9
-9


X
9
Y
9
17
Z

Pixl in IDSM





…still flying in the middle of the IDSM …

Material and Overlaps check

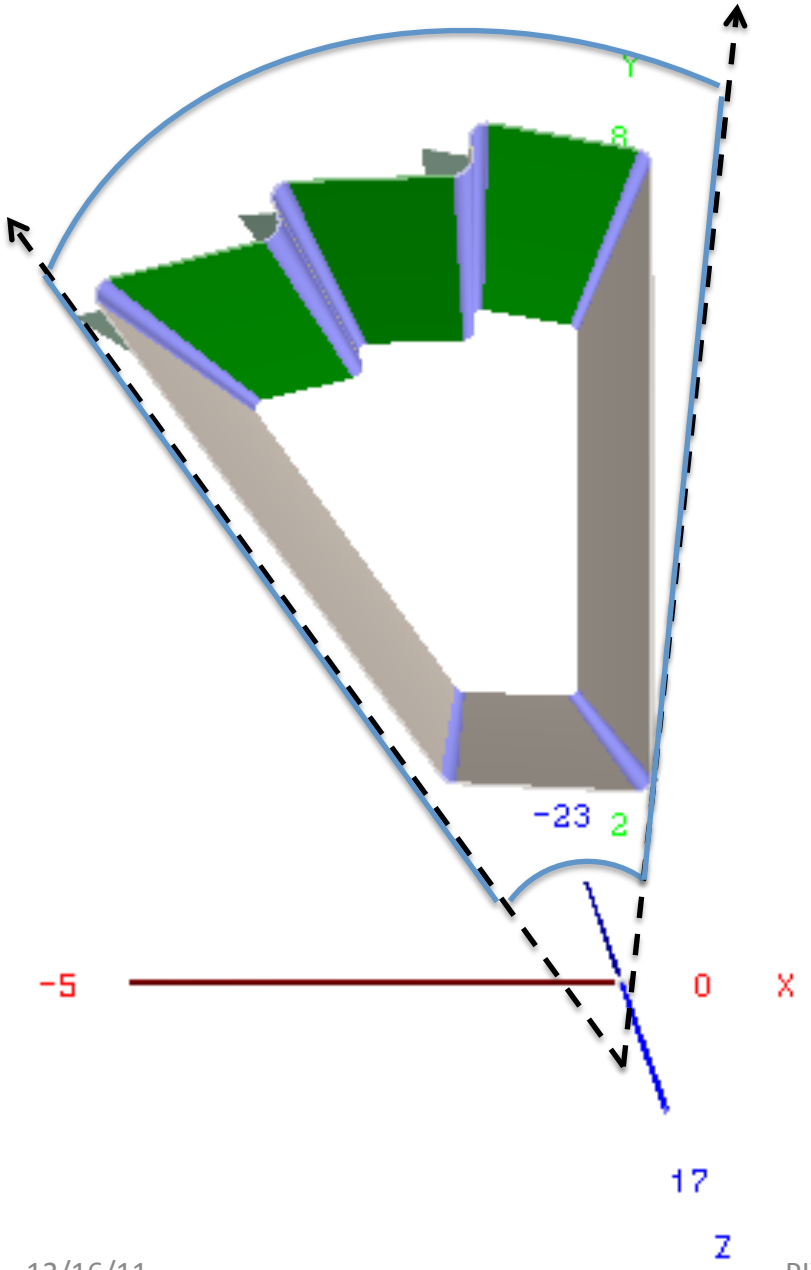
- All the structures here (arcs, planes) are made of carbon
- Only the active silicon pixel ladders is made of “silicon”

```
<!-- silicon -->
<Volume name="PXSA" comment="silicon right part of top sector"  >
<Material name="Sensitive" isvol="1"/>
<Attribute for="PXSA" seen="1" colo="5"  />
<Material name="Silicon"  />
<Shape type="BOX" dz="HalfPixZ" dx="HalfPixR" dy="HalfPixThk" />
     <Instrument block="PXSA"  >
         <Hit meas="z" opts="S" bins=".00001"  />
         <Hit meas="y" bins=".00001"  />
         <Hit meas="x" bins=".00001"  />
         <Hit meas="ptot" nbits="16" min="0" max="100"  />
         <Hit meas="cx" nbits="10"  />
         <Hit meas="cy" nbits="10"  />
         <Hit meas="cz" nbits="10"  />
         <Hit meas="sleng" nbits="16" min="0" max="500"  />
         <Hit meas="tof" nbits="16"  />
         <Hit meas="step" bins=".01"  />
         <Hit meas="eloss" nbits="16"  />
     </Instrument>
```

- TGeo has a package to detect overlaps/intrusion between volumes
- No overlaps has been found :
- The report is here : http://drupal.star.bnl.gov/STAR/system/files/TGeoManager_Check.pdf

Next steps

- Tentative schedule (~2 weeks):
  - Beam pipe from Amilkar
  - Needs also other parts of the Support Structure (MSC = PST+PIT, OSC)
  - Code in CVS
  - Refine the active silicon volume :
    - this can be added with no major changes to the global structure of the pixl code
  - Try to run starsim ?



To implement the full geometry based on a single sector :

- the single sector is “inserted” in a TUBS with phi1=35 and phi2=73, which then covers the opening angle of a sector by 1 degree left and right
- Rmin=2 and rmax =10 for the same reason of defining a volume a bit larger that the “real” sector
- A TUBS shape should be placed according to the origin of the cone
- The origin of this shape is 0.0001 not 0) in order to project the 2 components in X and Y