

Geometry update

BIC Bi-Weekly Simulation Helpdesk

Pusan Nation University

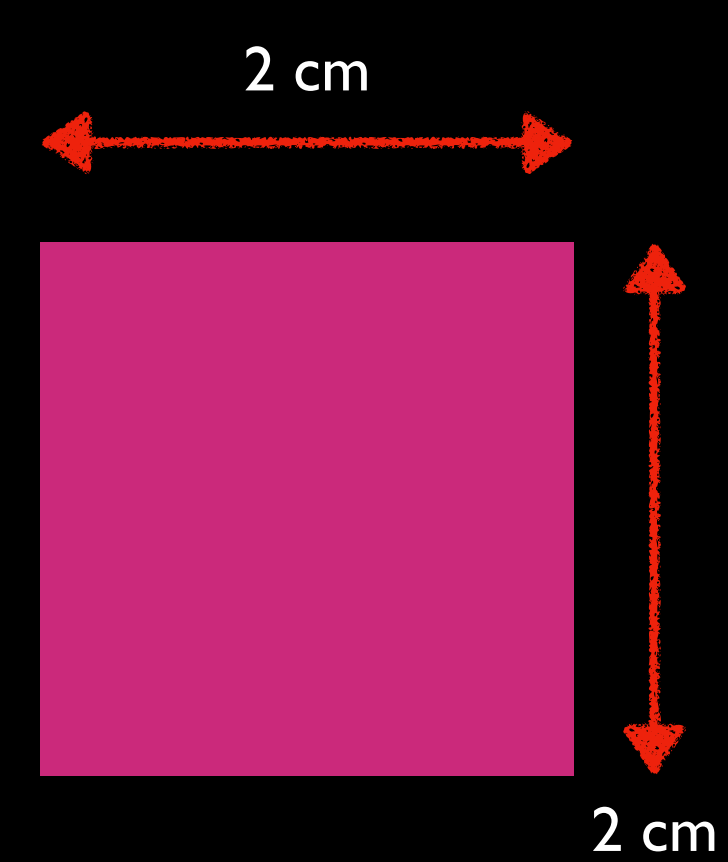
30 July 2024

Jaehyeok Ryu

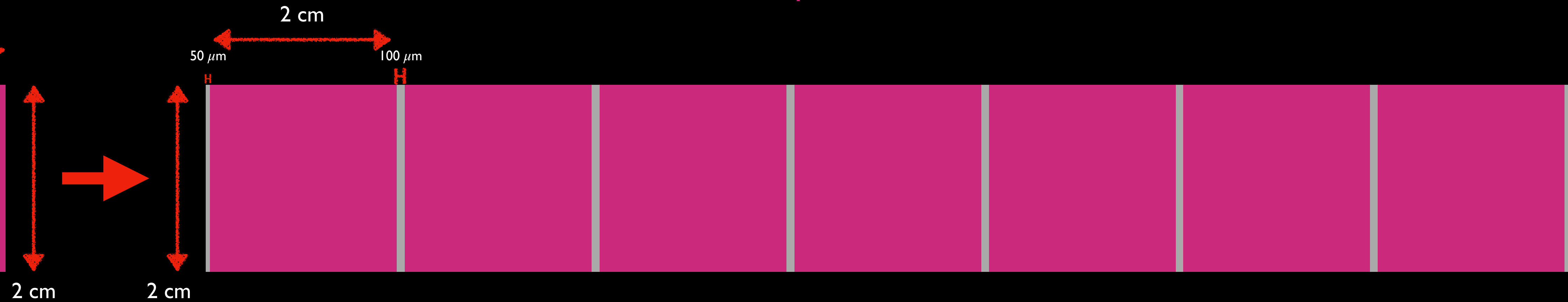
Geometry update

Module update

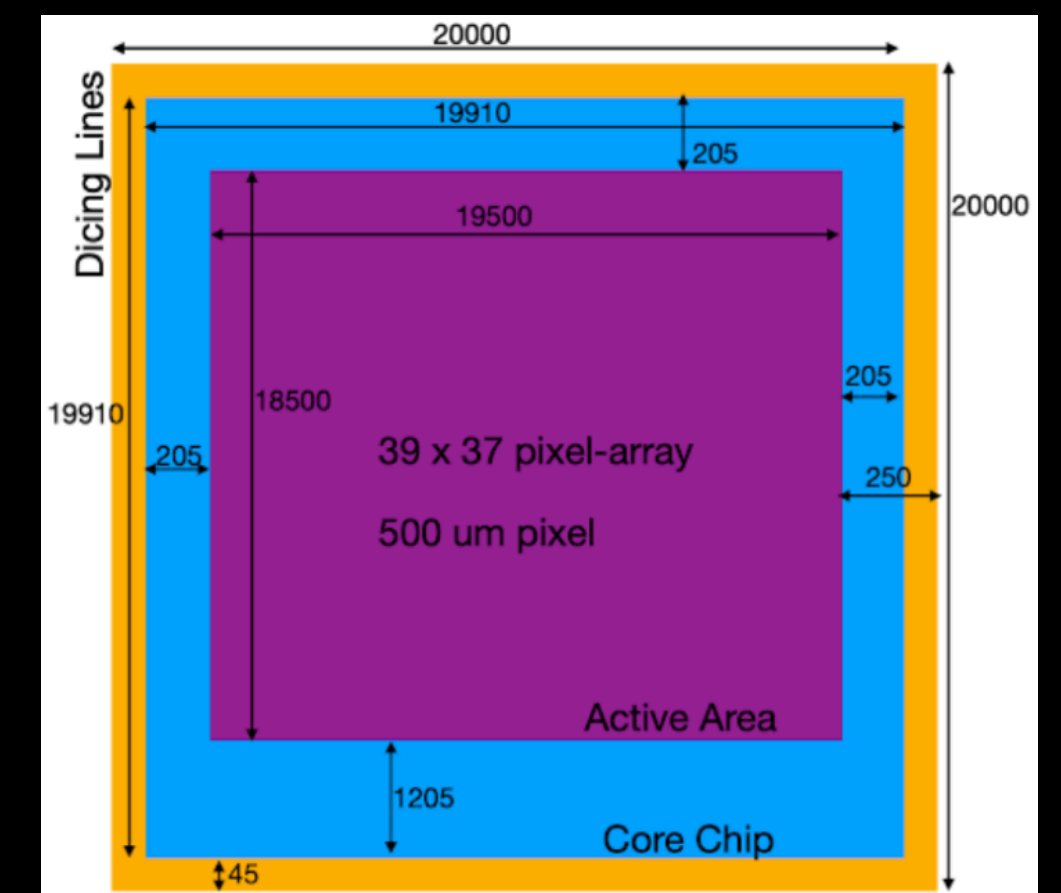
Current module



Updated module



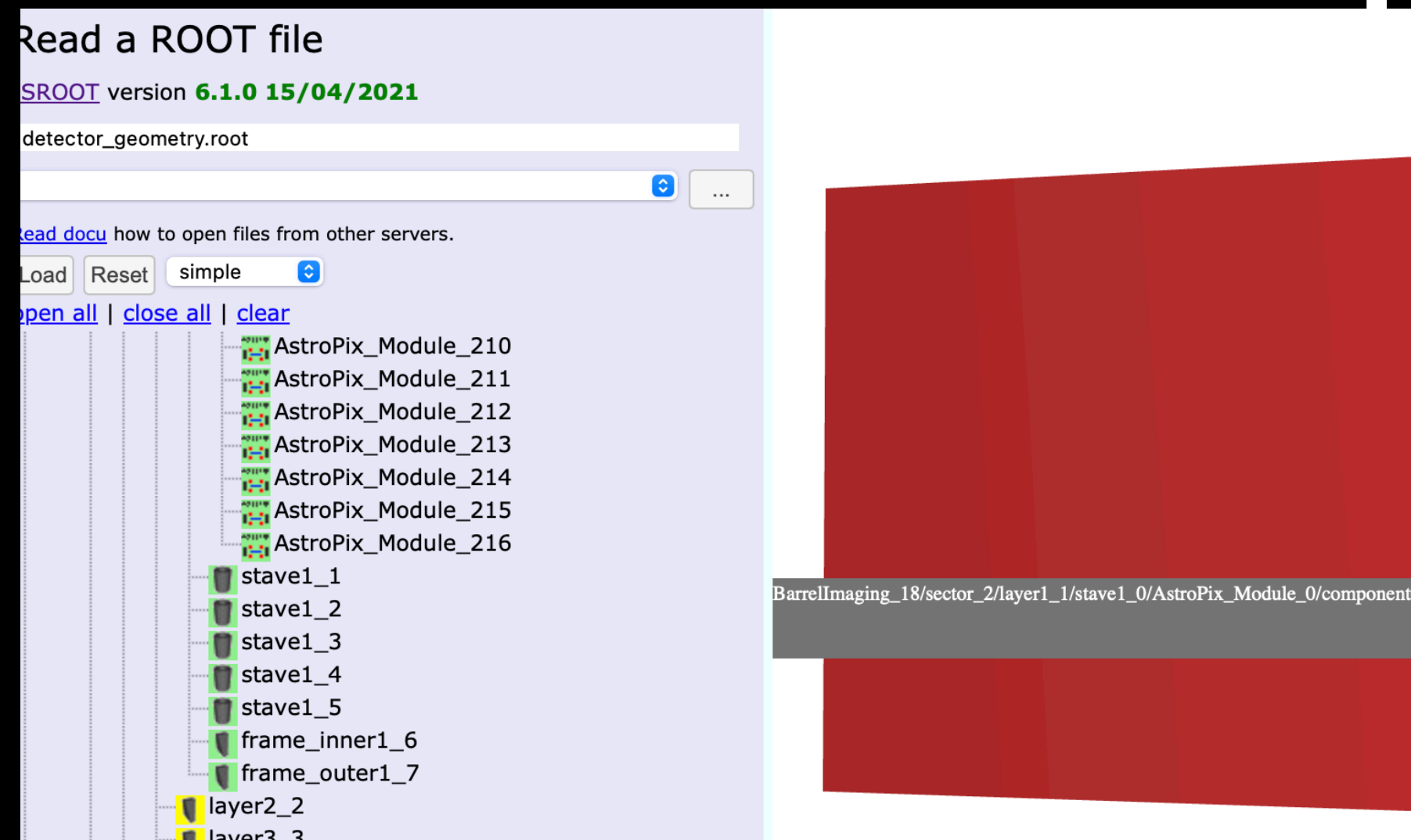
- Changed module geometry from single chip (2 x 2 cm) to 9-chip (2 x 2.01 cm x 9) module



Will be updated

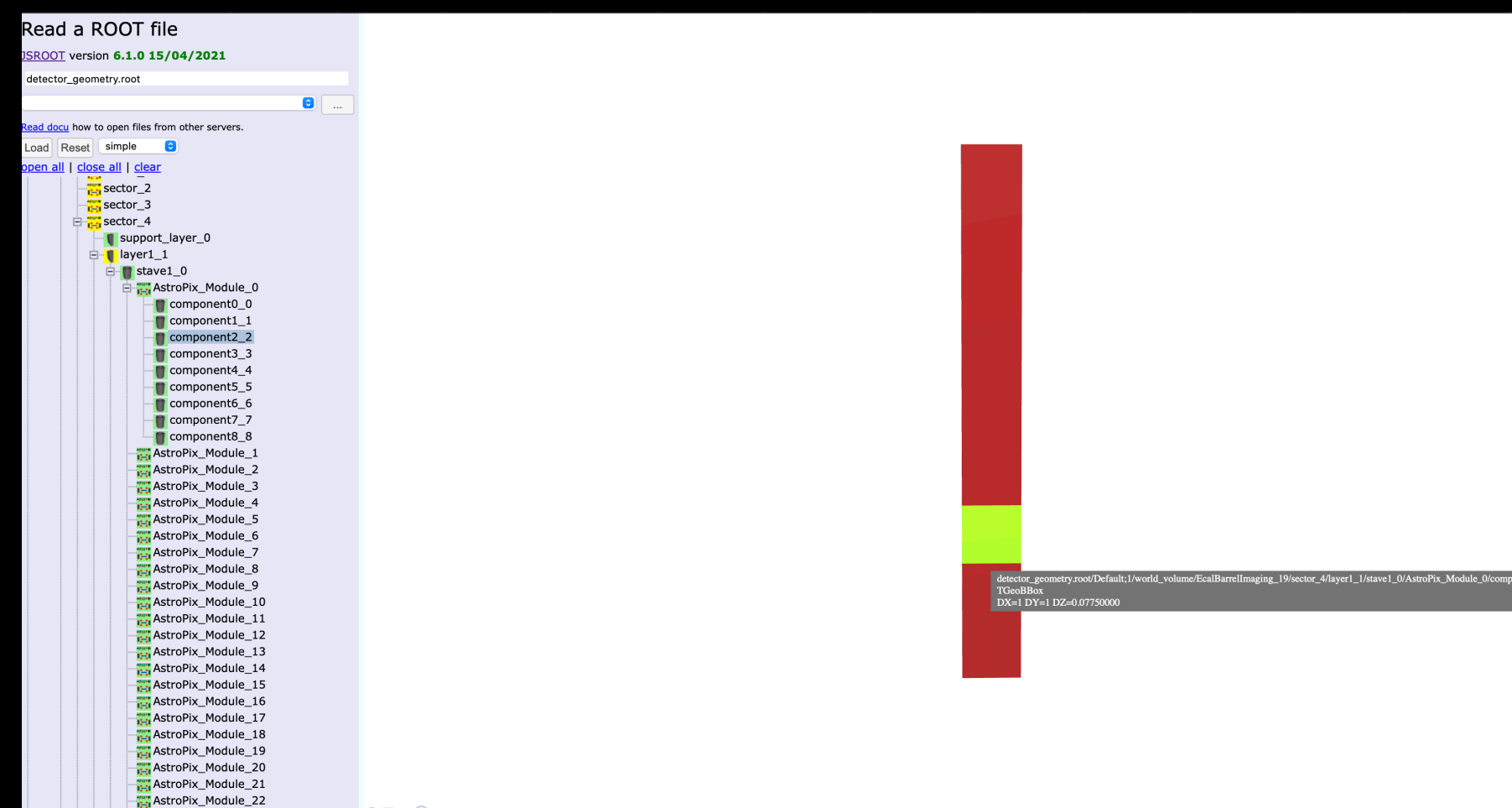
Geometry update

Module update



```

<module name="AstroPix_Module"
  vis="EcalBarrelModuleVis">
  <module_component name="AstroPix_Chip"
    material="Silicon"
    width="EcalBarrel_AstroPix_width"
    length="EcalBarrel_AstroPix_length"
    thickness="EcalBarrel_AstroPix_thickness"
    vis="EcalBarrelModuleVis">
    <slice material="Silicon" thickness="EcalBarrel_SiliconThickness" vis="EcalBarrelSliceVis" sensitive="yes" limits="cal_limits"/>
    <slice material="Silicon" thickness="EcalBarrel_ElectronicsThickness" vis="EcalBarrelSliceVis"/>
    <slice material="Copper" thickness="EcalBarrel_CopperThickness" vis="EcalBarrelSliceVis"/>
    <slice material="Kapton" thickness="EcalBarrel_KaptonThickness" vis="EcalBarrelSliceVis"/>
    <slice material="Epoxy" thickness="EcalBarrel_EpoxyThickness" vis="EcalBarrelSliceVis"/>
  </module_component>
</module>
  
```



```

<module name="AstroPix_Module"
  vis="EcalBarrelModuleVis"
  repeat="9">
  <module_component name="AstroPix_Chip"
    material="Silicon"
    width="EcalBarrel_AstroPix_width"
    length="EcalBarrel_AstroPix_length"
    thickness="EcalBarrel_AstroPix_thickness"
    vis="EcalBarrelModuleVis">
    <slice material="Silicon" thickness="EcalBarrel_SiliconThickness" vis="EcalBarrelSliceVis" sensitive="yes" limits="cal_limits"/>
    <slice material="Silicon" thickness="EcalBarrel_ElectronicsThickness" vis="EcalBarrelSliceVis"/>
    <slice material="Copper" thickness="EcalBarrel_CopperThickness" vis="EcalBarrelSliceVis"/>
    <slice material="Kapton" thickness="EcalBarrel_KaptonThickness" vis="EcalBarrelSliceVis"/>
    <slice material="Epoxy" thickness="EcalBarrel_EpoxyThickness" vis="EcalBarrelSliceVis"/>
    <slice material="Aluminum" thickness="EcalBarrel_AstroPix_Support_Thickness" vis="EcalBarrelSliceVis" length="EcalBarrel_AstroPix_Support_length"/>
  </module_component>
</module>
  
```

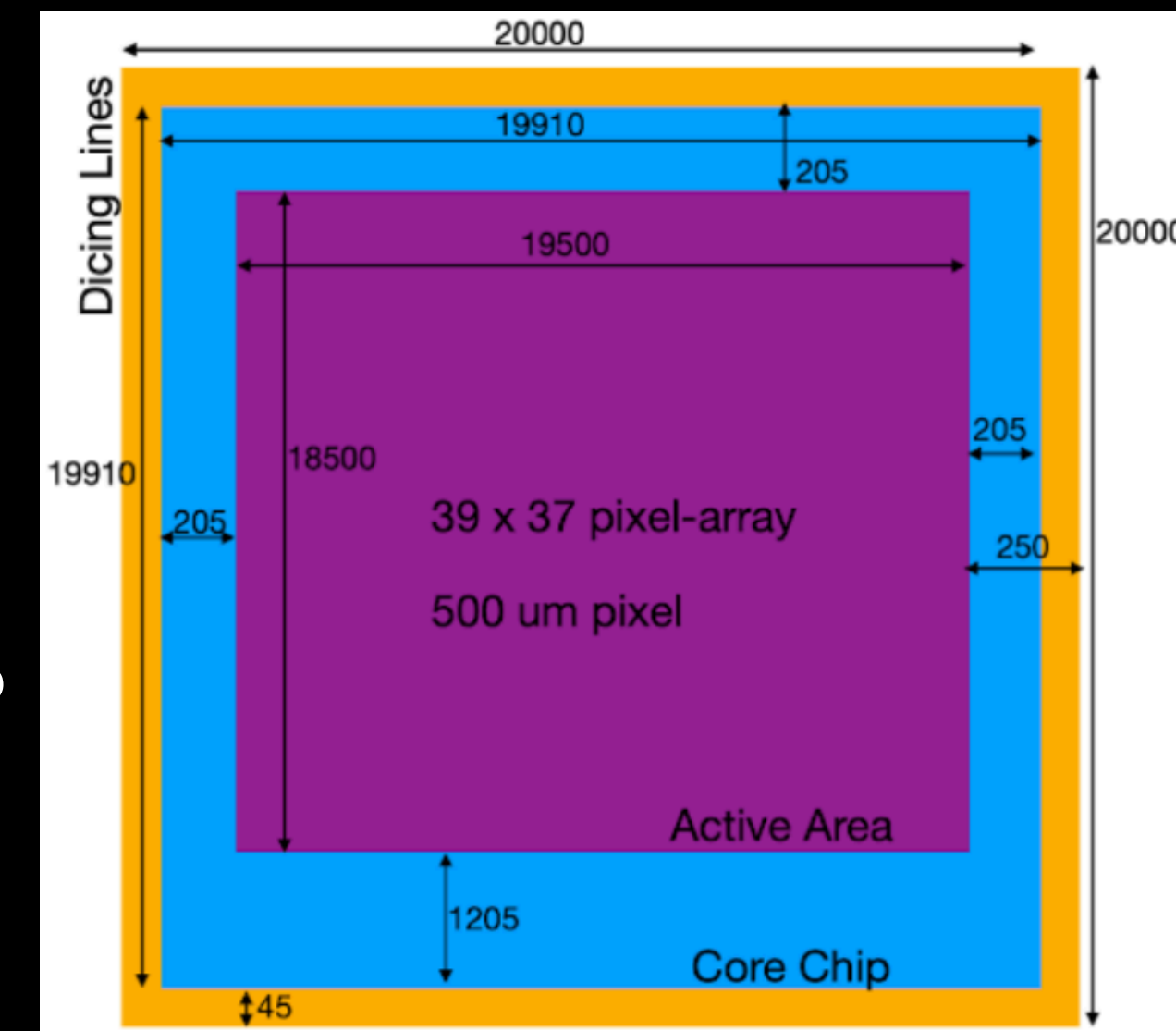
Geometry update

Module update

Questions on the geometry update

```
vis="EcalBarrelStaveVis">  
<xy_layout  
  dx="EcalBarrel_AstroPix_width + EcalBarrel_AstroPix_margin"  
  dy="EcalBarrel_AstroPix_length + EcalBarrel_AstroPix_margin"  
</>
```

- Just left the margin, what is this margin?
- Chip geometry from May, is there the latest one of this?
- For now, there are only 2 x 2 cm Chip materials(slices) and a support slice with 2 x 2.01 cm
For implementing chips geometry like on the right hand side, Is it right I make silicon smaller than the 2 x 2 for example 19910 x 19910 or 19500 x 18500?



Geometry update

Sensitive detectors

Set all materials to be sensitive in .xml file

```
vis="EcalBarrelModuleVis">
  <slice material="Silicon" thickness="EcalBarrel_SiliconThickness" vis="EcalBarrelSliceVis" sensitive="yes" limit="1" />
  <slice material="Silicon" thickness="EcalBarrel_ElectronicsThickness" vis="EcalBarrelSliceVis" sensitive="yes" /> <component name="Silicon" position="(0,0,0)" />
  <slice material="Copper" thickness="EcalBarrel_CopperThickness" vis="EcalBarrelSliceVis" sensitive="yes" /> <component name="Copper" position="(0,0,0)" />
  <slice material="Kapton" thickness="EcalBarrel_KaptonThickness" vis="EcalBarrelSliceVis" sensitive="yes" /> <component name="Kapton" position="(0,0,0)" />
  <slice material="Epoxy" thickness="EcalBarrel_EpoxyThickness" vis="EcalBarrelSliceVis" sensitive="yes" /> <component name="Epoxy" position="(0,0,0)" />
</module_component>
</module>

<support thickness="EcalBarrel_FrontSupportThickness" material="Aluminum" vis="EcalBarrelSupportVis" sensitive="yes" />

<layer repeat="1" vis="EcalBarrelLayerVis"
  thickness="EcalBarrel_LayerThickness"
  material="Aluminum"
  position="(0,0,0)"
  sensitive="yes" />
</layer>
</module>
```

Set higher volumes to be sensitive in .cpp file
e.g. detector_volume or sector_volume

```
43  detector_volume.setSensitiveDetector(sens);
44
45  detector_volume.setSensitiveDetector(sens);
46
```

```
    }
    sector_volume.setSensitiveDetector(sens);
    // Place layer into sector
```

- Both method failed, any ideas?