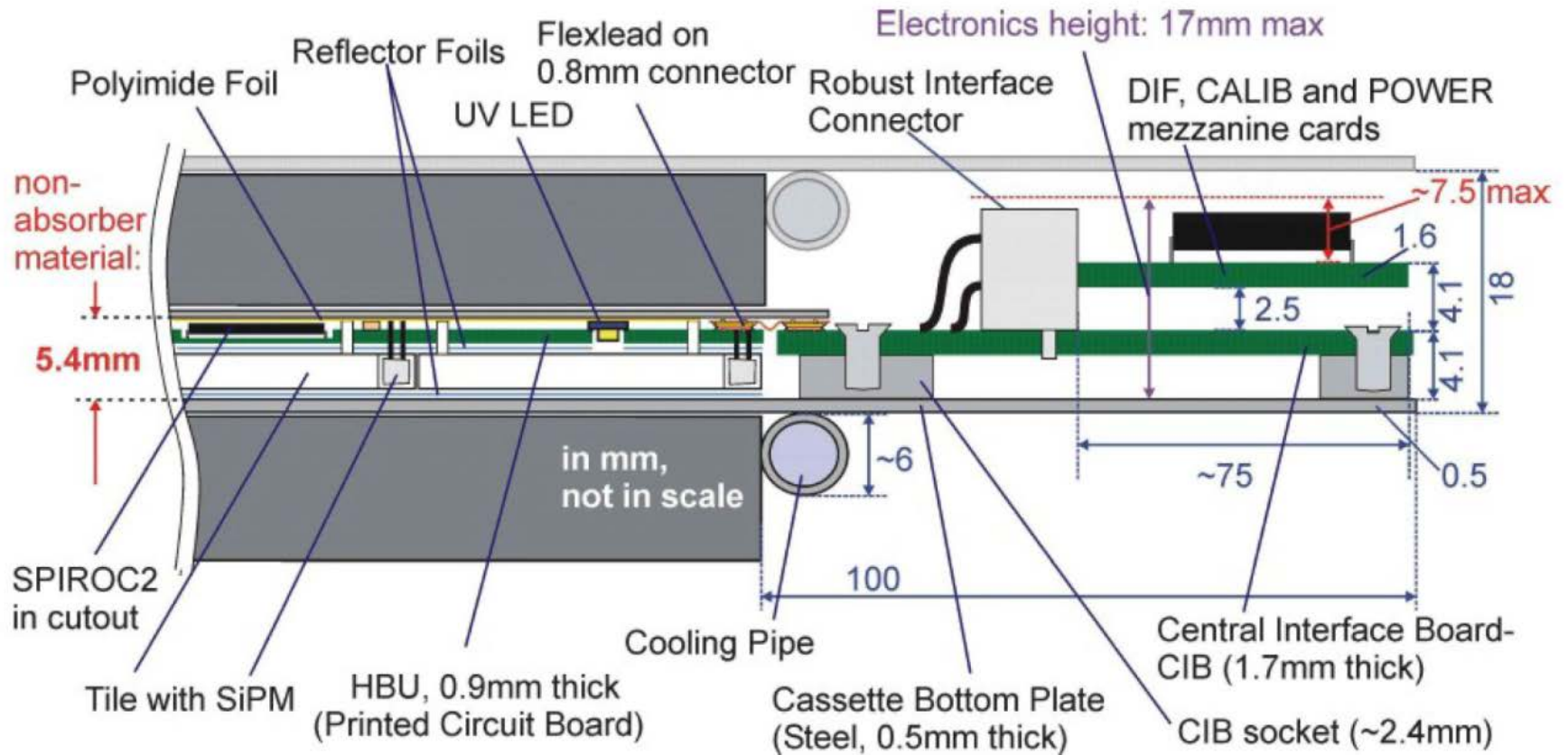# SiD AHCAL (Scintillator/SiPM/Steel) Modeling
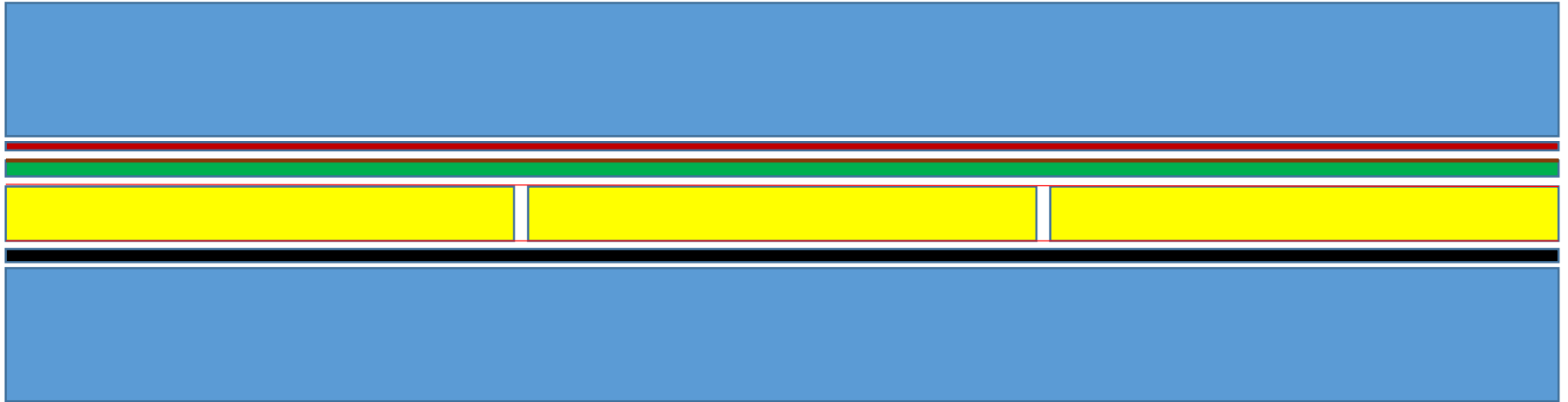
Ross McCoy, Andrew Myers, Andy White
6/28/2016

# CALICE AHCAL – layer structure – engineering prototype
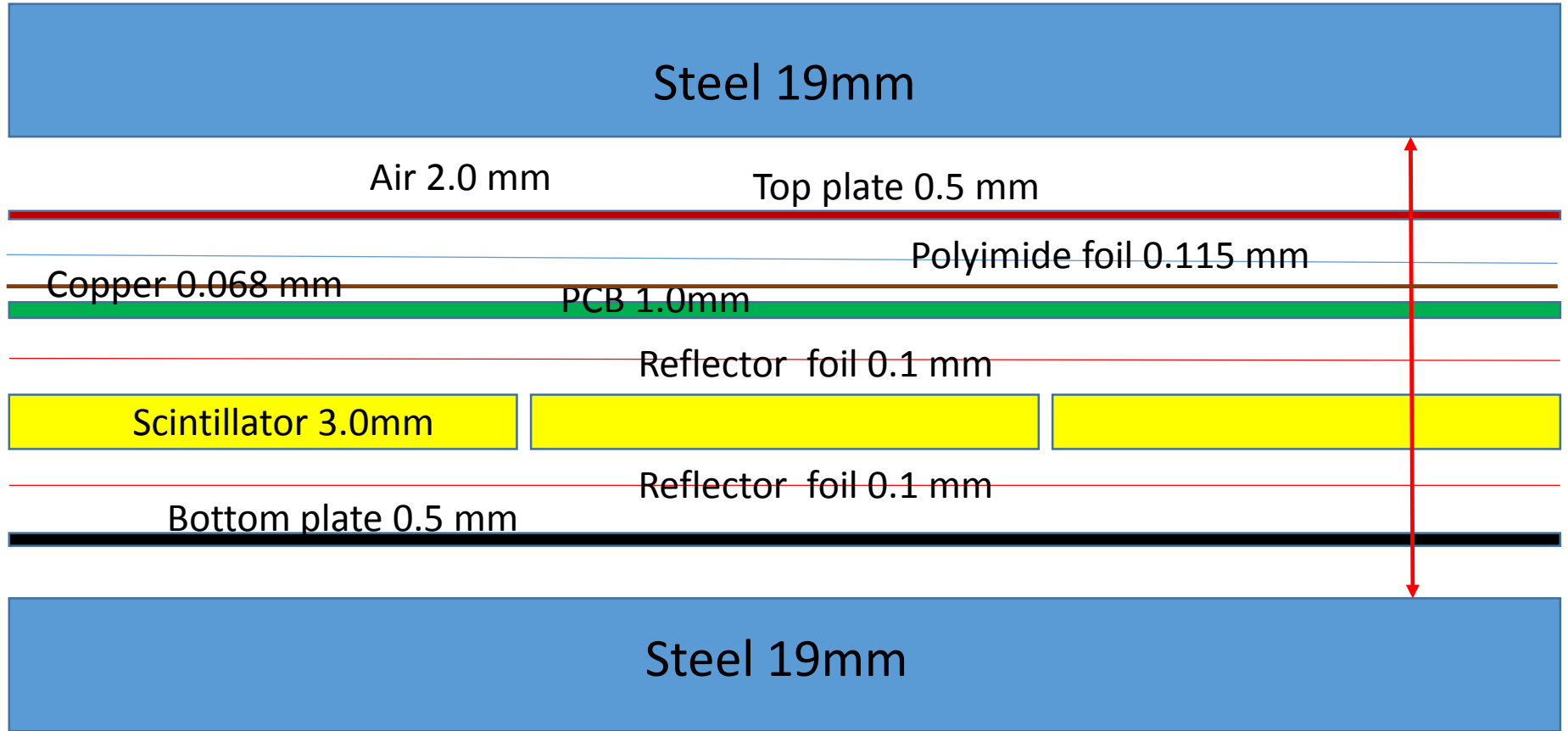


(courtesy Oskar Hartbrich/DESY/CALICE)

# Draft SiD AHCAL layer structure – for DD4HEP implementation

# Draft SiD AHCAL layer structure – for DD4HEP implementation



Steel 19mm

Air 2.0 mm          Top plate 0.5 mm

Polyimide foil 0.115 mm

Copper 0.068 mm          PCB 1.0mm

Reflector foil 0.1 mm

Scintillator 3.0mm

Reflector foil 0.1 mm

Bottom plate 0.5 mm

Steel 19mm

Active layer thickness = 7.383 mm

# CALICE AHCAL 2015 TB Prototype materials/dimensions

```xml
- <define>
        <!-- world -->
    <constant name="world_side" value="3000*mm"/>
    <constant name="world_x" value="world_side"/>
    <constant name="world_y" value="world_side"/>
    <constant name="world_z" value="world_side"/>
        <!-- Materials -->
    <constant name="Hcal_radiator_thickness" value="19.0*mm"/>
    <constant name="airgap_thickness" value="0.5*mm"/>
    <constant name="cassette_thickness" value="0.5*mm"/>
    <constant name="cable_mix_thickness" value="1.5*mm"/>
    <constant name="pcb_thickness" value="0.7*mm"/>
    <constant name="foil_thickness" value="0.115*mm"/>
    <constant name="Hcal_scintillator_thickness" value="3*mm"/>
    <constant name="Ecal_radiator_thickness" value="19.0*mm"/>
    <constant name="Ecal_scintillator_thickness" value="2*mm"/>
    <constant name="env_safety" value="0.01*mm"/>
```
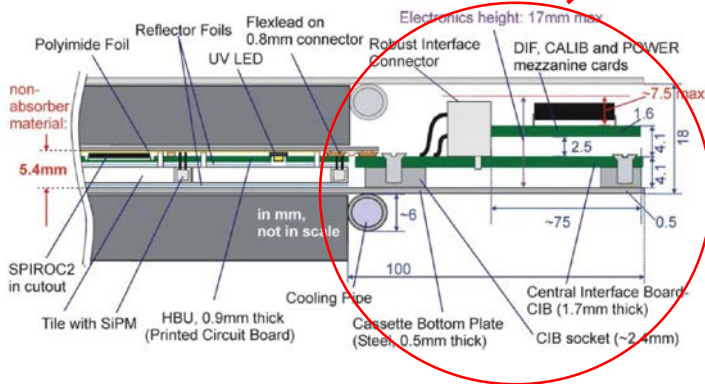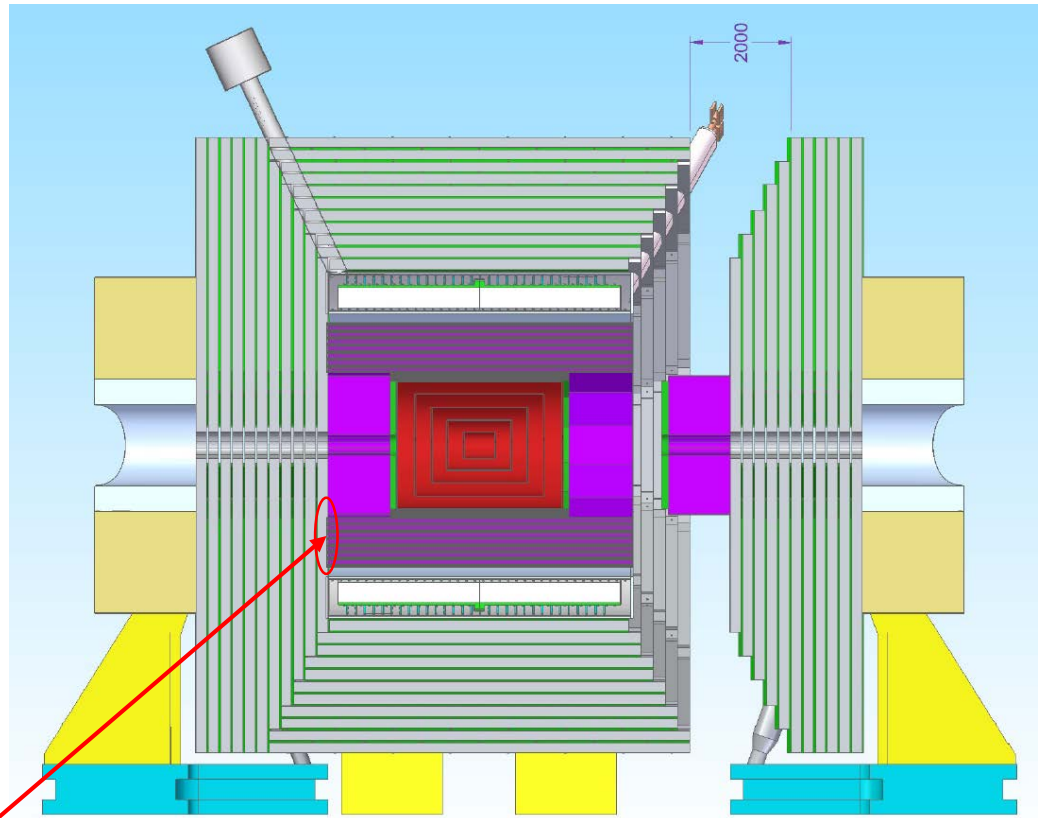
# SiD AHCAL
# End-of-module
# service area



SiD AHCAL barrel
  R(outer) = 2560 mm
  R(inner)  = 1403 mm
Difference = 1157 mm

40 x 7.383 mm = 1055.32 mm