

SCSWT'2012

South Caucasus Software / Computing Workshop & Tutorial

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# Checking the overlaps in G4 geometry baseline

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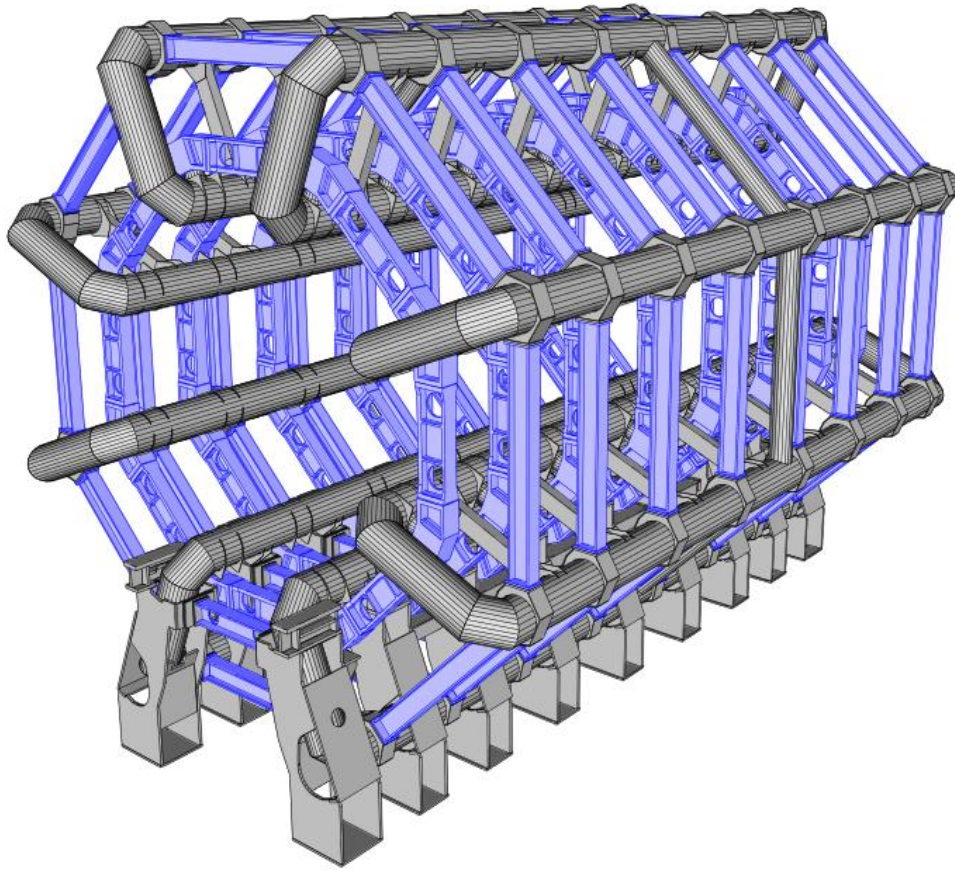
*Georgian Technical University*



# Outline

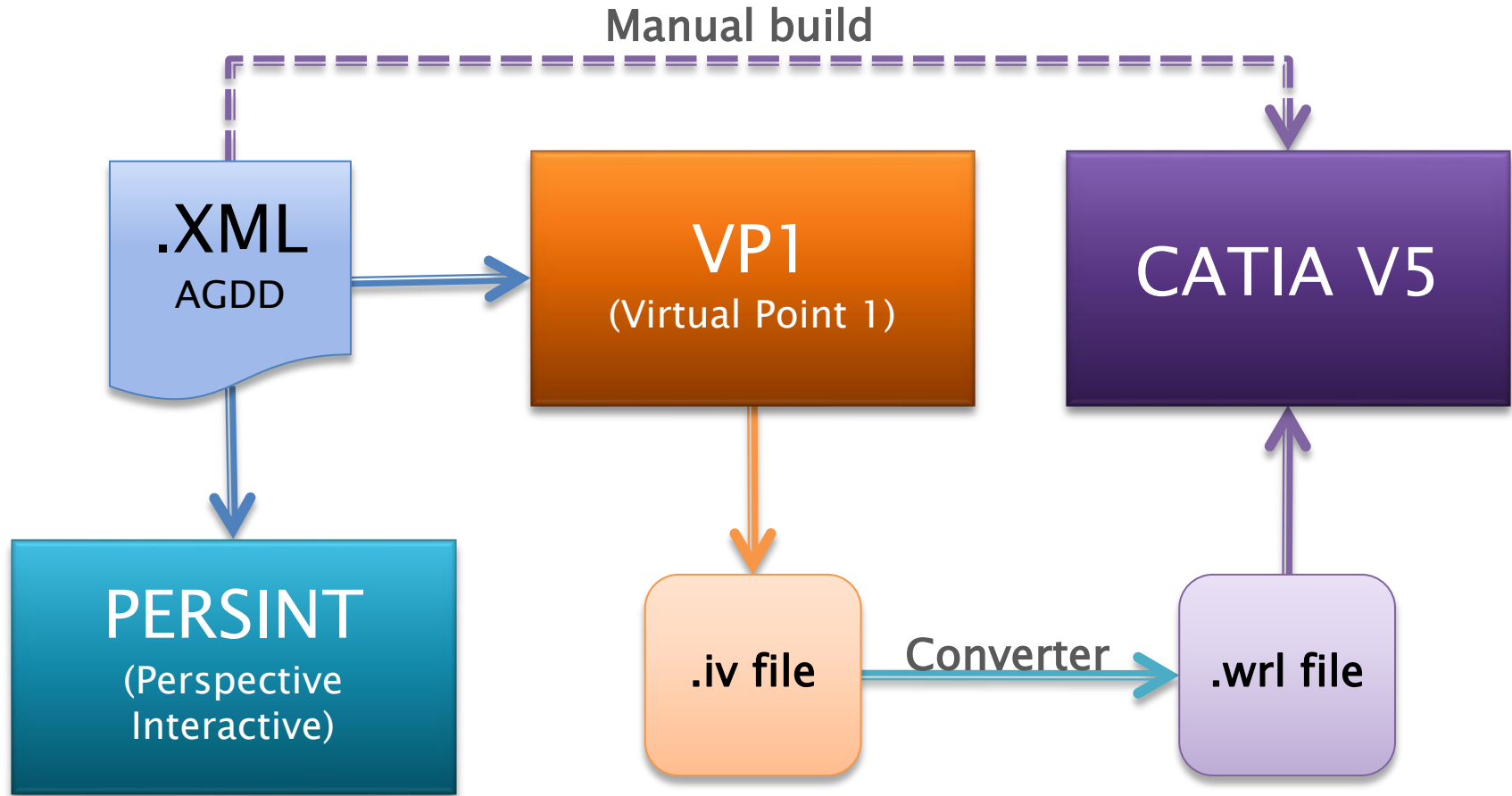
- ▶ ATLAS Generic Detector Description (AGDD) visualization in PERSINT, VP1, CATIA V5
- ▶ Overlap Checking of AGDD Geometry in CATIA V5
- ▶ Summaries and next steps

# ATLAS Generic Detector Description (AGDD)



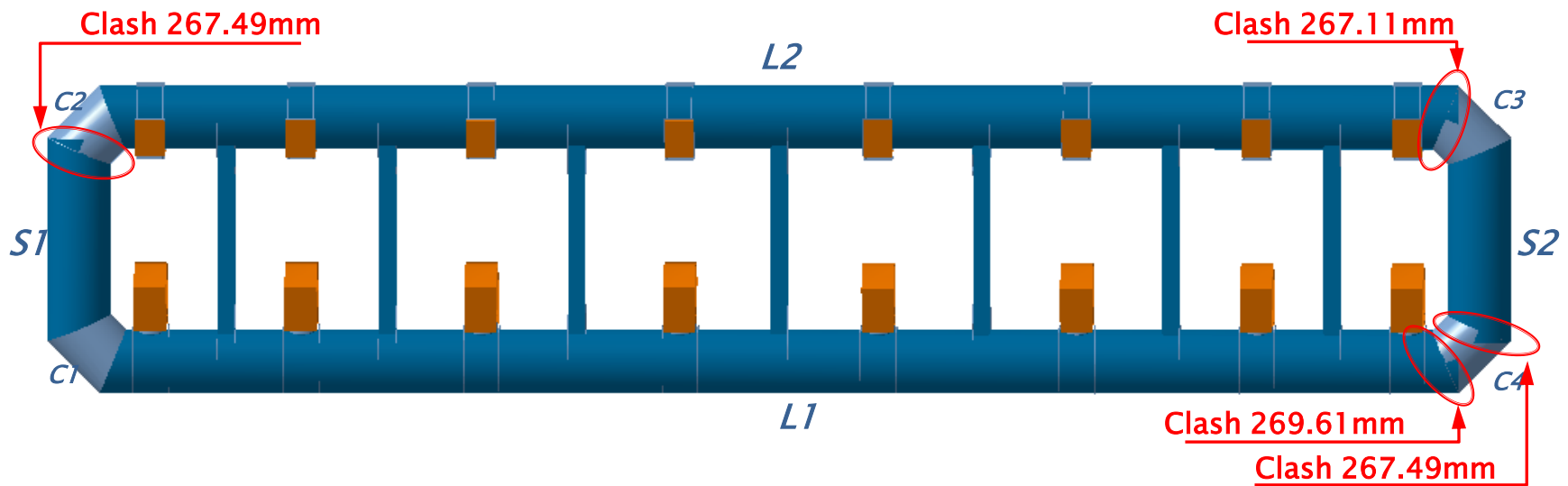
- Elementary Solids
  - Box , tube, etc...
- Boolean Solids
  - Union, Subtraction, etc...
- Logical grouping of Volumes
  - Composition, stack, etc...

# AGDD Geometry visualization



# Coil overlap checking in CATIA V5

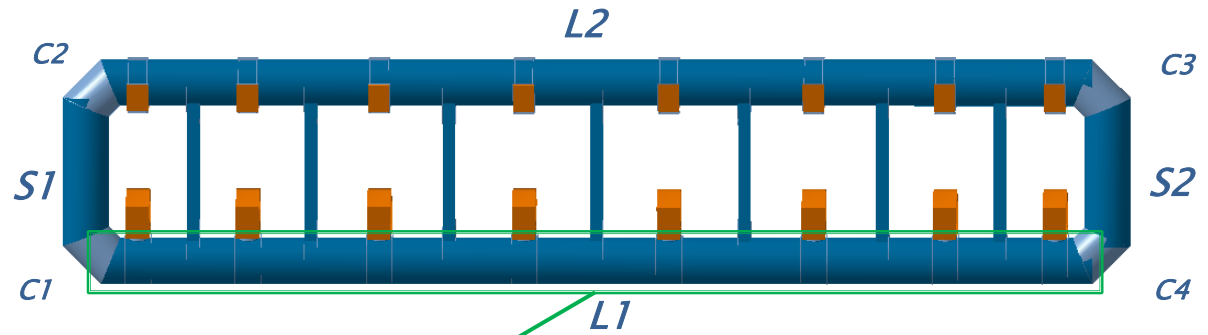
Clash		Coil (Out Tubes)
<i>Vol. 1 Parts</i>		<i>Sector 2</i>
<i>C3</i>	<i>L2</i>	267.11 mm
<i>C3</i>	<i>S2</i>	0.03 mm
<i>C2</i>	<i>L2</i>	0
<i>C2</i>	<i>S1</i>	267.49 mm
<i>C1</i>	<i>L1</i>	0.04 mm
<i>C1</i>	<i>S1</i>	0.03 mm
<i>C4</i>	<i>L1</i>	269.61 mm
<i>C4</i>	<i>S2</i>	267.49 mm



# L1 (BAR\_CryoTubAlongZ\_Down)

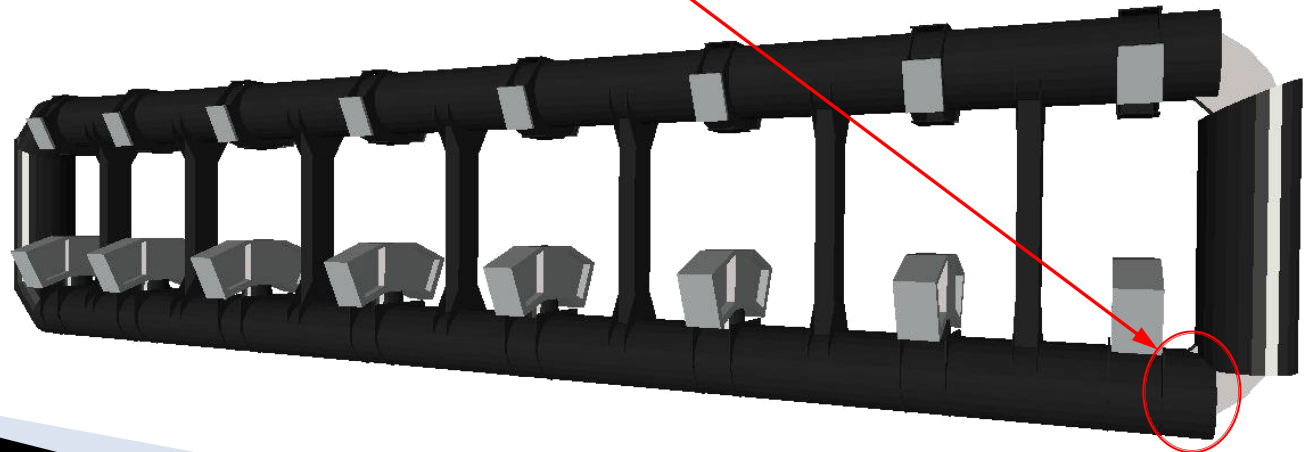
Sector 2

Image from  
CATIA



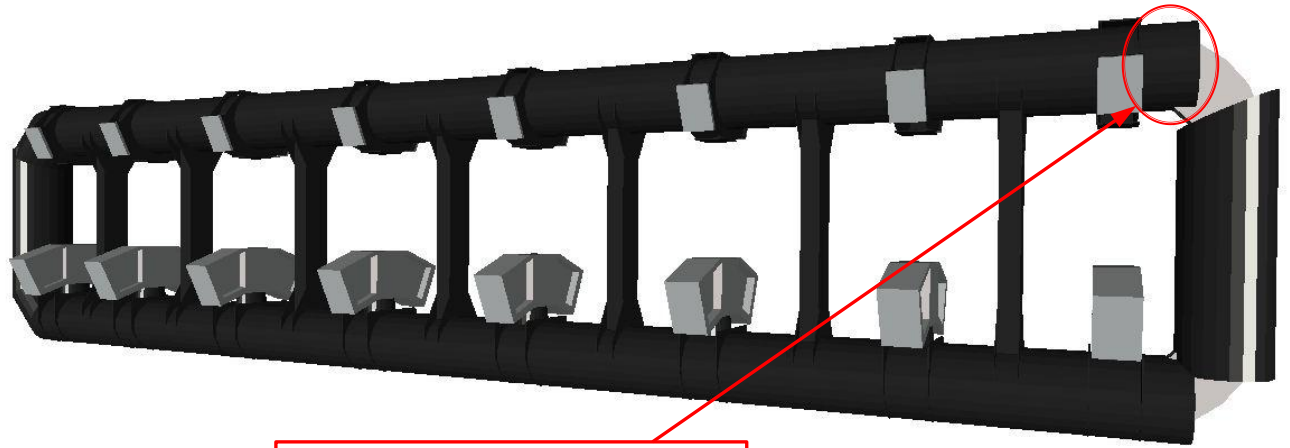
This part is not cutted.  
Clash 269.61 mm

Image  
from VP1



# L2 (BAR\_CryoTubAlongZ\_Up)

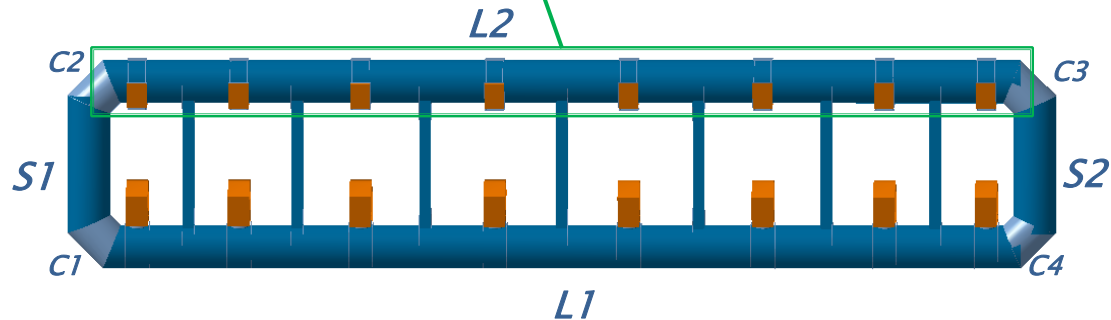
Image from  
VP1



This part is not cutted.  
Clash 267.11 mm



Image from  
CATIA





# S1 (BAR\_CryoTubAlongR\_Plus)

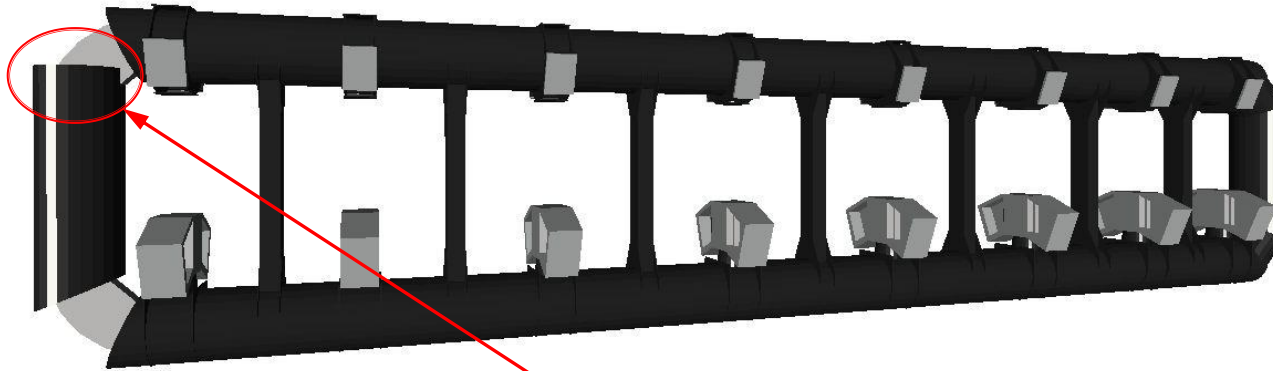


Image from  
VPI

This part is not cutted.  
Clash 267.49mm

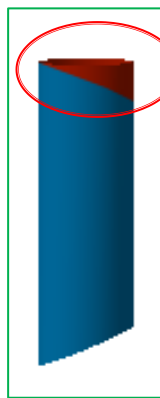
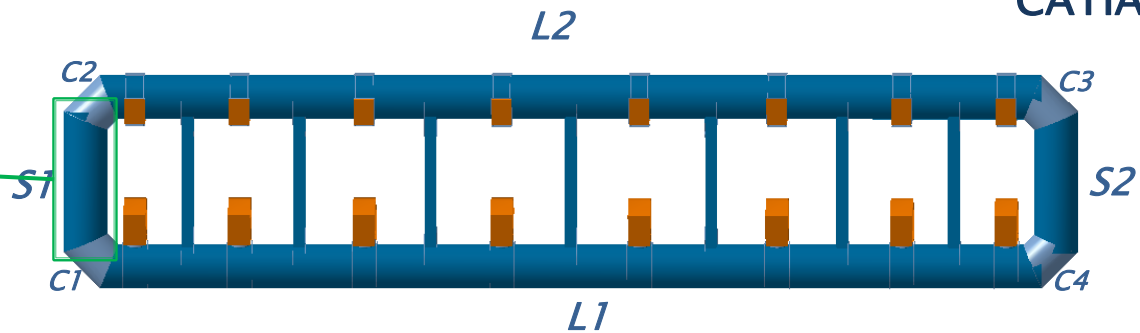


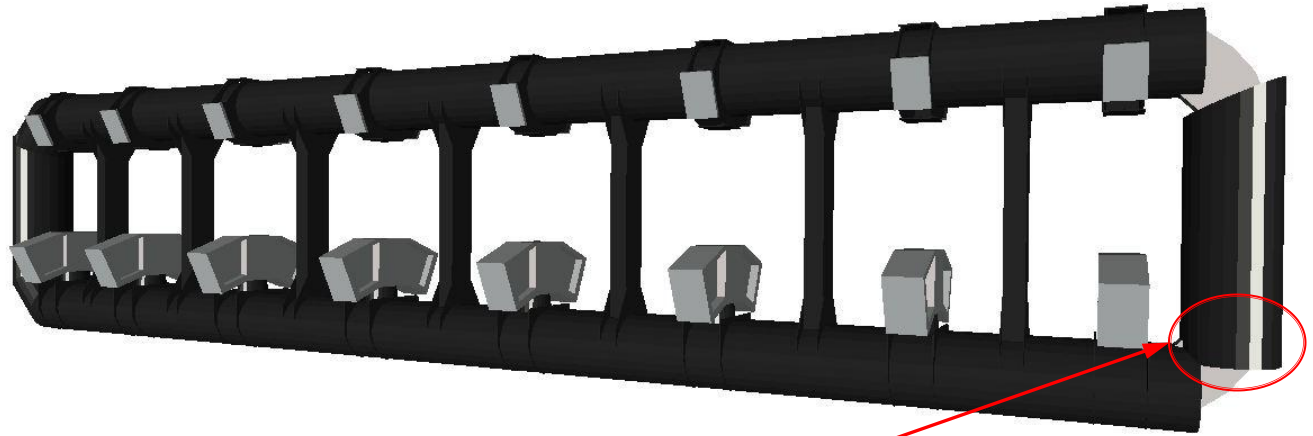
Image from  
CATIA





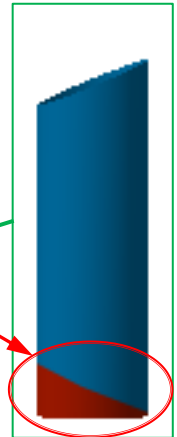
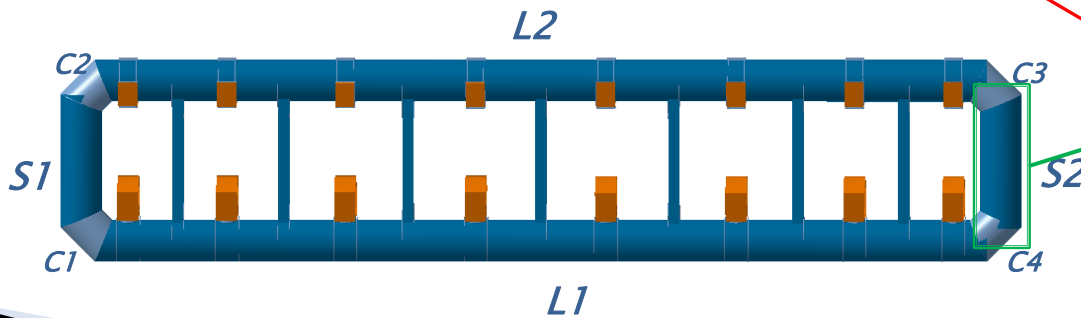
# S2 (BAR\_CryoTubAlongR\_Plus)

Image from VP1

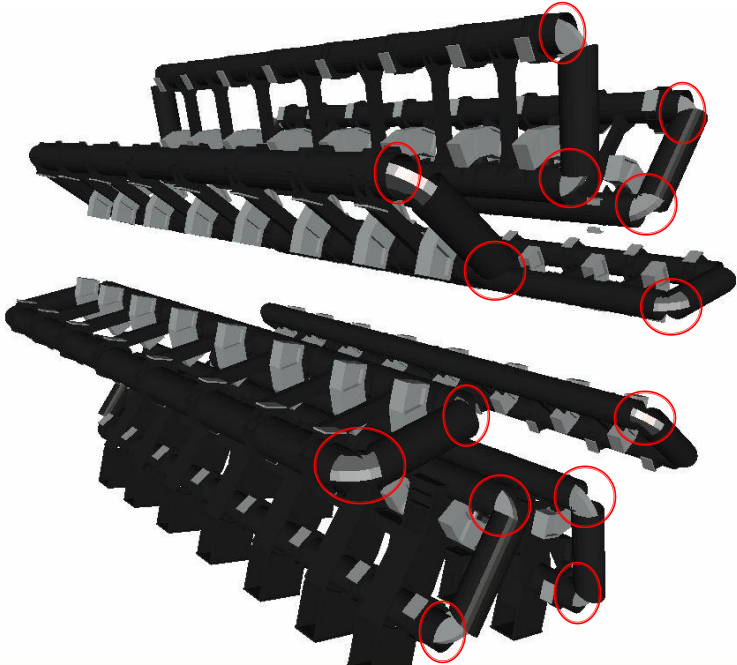


This part is not cutted.  
Clash 267.49mm

Image from  
CATIA

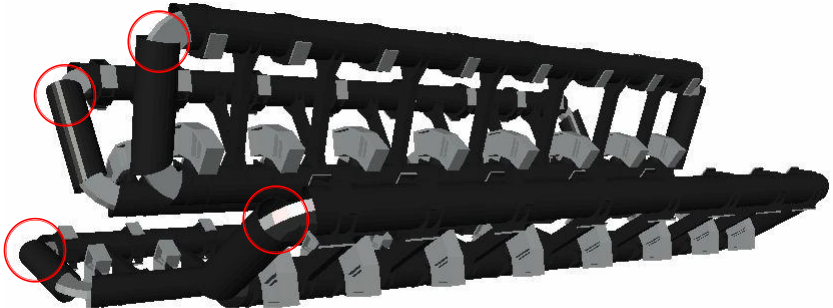


# COIL (All Sectors)

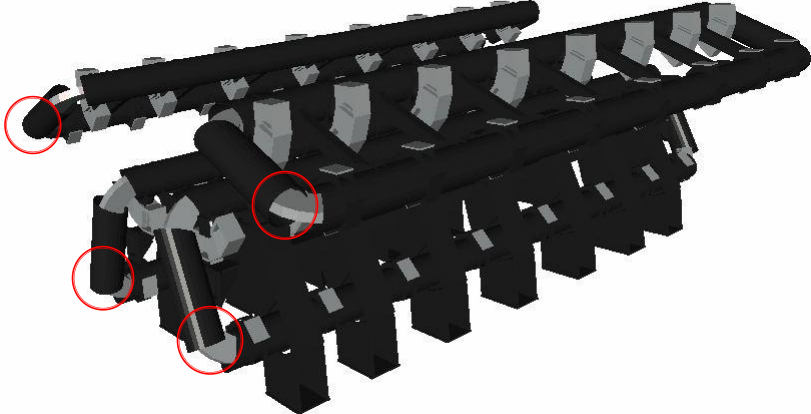


Side A

The clashes are fixed in all sectors



Side C



*Images from VPI*

# Part of COIL (XML code)

```
<tubs name="BAR_CryoTubAlongZBase" material="Iron1" Rio_Z="ABRT_CryoRadi_Radius -  
ABRT_CryoRadT_RadThick; ABRT_CryoRadi_Radius;  
2.*ABRT_CryoZmax - 2.*ABRT_CryoRadi_Radius - ABRT_CryoRcur*sqrt(2.) +  
2.*GENV_Ta225*ABRT_CryoRadi_Radius" nbPhi="25" />
```

```
<box name="BAR_CryoTubCutBox" material="Iron1" X_Y_Z="2.*ABRT_CryoRadi_Radius/GENV_Co225;  
2.*ABRT_CryoRadi_Radius/GENV_Co225; 2.*ABRT_CryoRadi_Radius/GENV_Co225 " />
```

```
<subtraction name="BAR_CryoTubAlongZ_Up" >  
<posXYZ volume="BAR_CryoTubAlongZBase" X_Y_Z=" ABRT_CryoRmax - ABRT_CryoRadi_Radius; 0. ; 0. "/>  
<posXYZ volume="BAR_CryoTubCutBox" X_Y_Z=" ABRT_CryoRmax - ABRT_CryoRadi_Radius -  
ABRT_CryoRadi_Radius*GENV_Ta225 ; 0. ;  
ABRT_CryoZmax - ABRT_CryoRcur/sqrt(2.) - GENV_Eps " rot="0. ; -22.5 ; 0. "/>  
<posXYZ volume="BAR_CryoTubCutBox" X_Y_Z=" ABRT_CryoRmax - ABRT_CryoRadi_Radius -  
ABRT_CryoRadi_Radius*GENV_Ta225 ; 0. ;  
-(ABRT_CryoZmax - ABRT_CryoRcur/sqrt(2.) - GENV_Eps)"  
rot=" 0. ; 22.5 ; 0. "/>  
<foreach index="Irib" begin="0" loops="7" >  
<posXYZ volume="BAR_CryoRibIn" X_Y_Z=" (ABRT_CryoRmax+ABRT_CryoRmin)/2. ; 0. ; ABRT_Zrib[Irib] " />  
</foreach>  
</subtraction>
```

# COIL (Visualization in PERSINT)

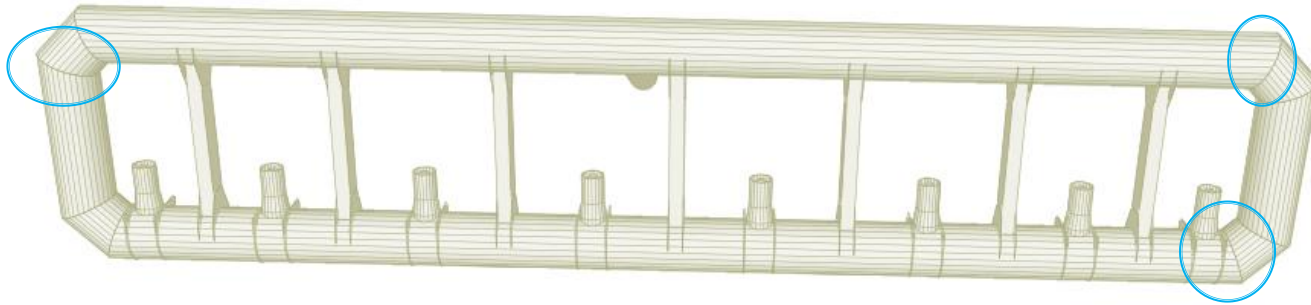


Image from  
PERSINT

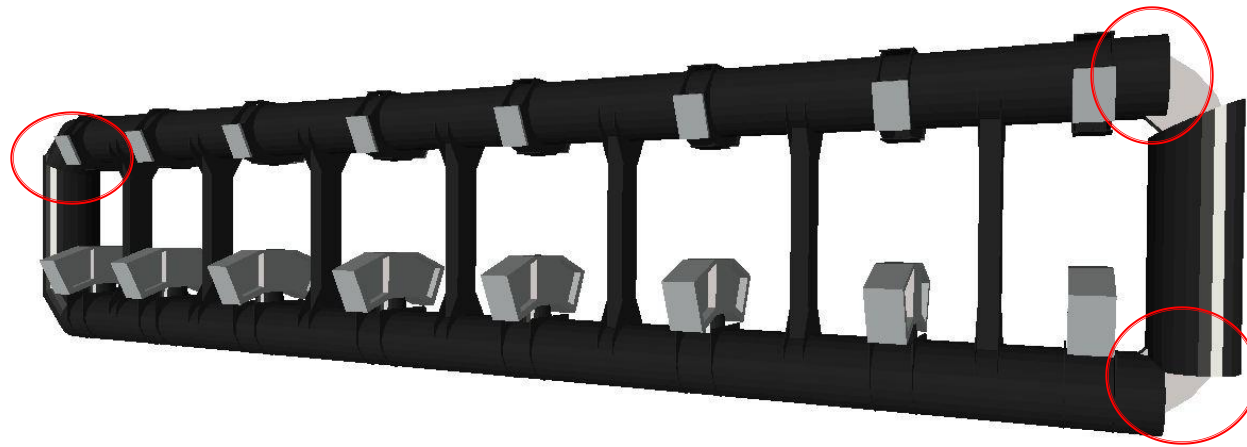


Image from  
VP1

# Summary and next steps

- ▶ From AGDD xml code were fixed 84 parts of detector, which contains Boolean operation
- ▶ we are going to do overlap analysis for each parts of detector