Development of Reference Geometry in CATIA

SCSWT'2012

South Caucasus Software / Computing Workshop & Tutorial

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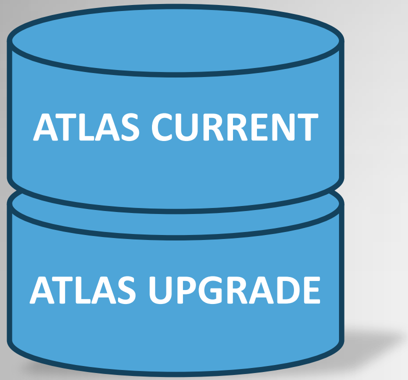
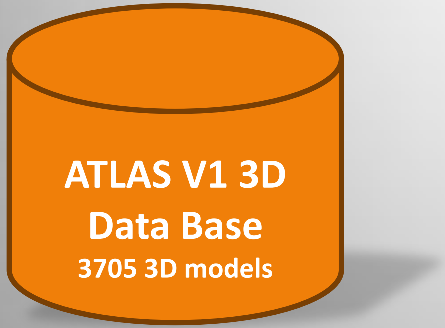
Outline

- ATLAS V1 3D Data Base
- SmarTeam 3D Data Base
- Reference Geometry in CATIA
- Conclusion

Atlas V1 and SmarTeam Data Base



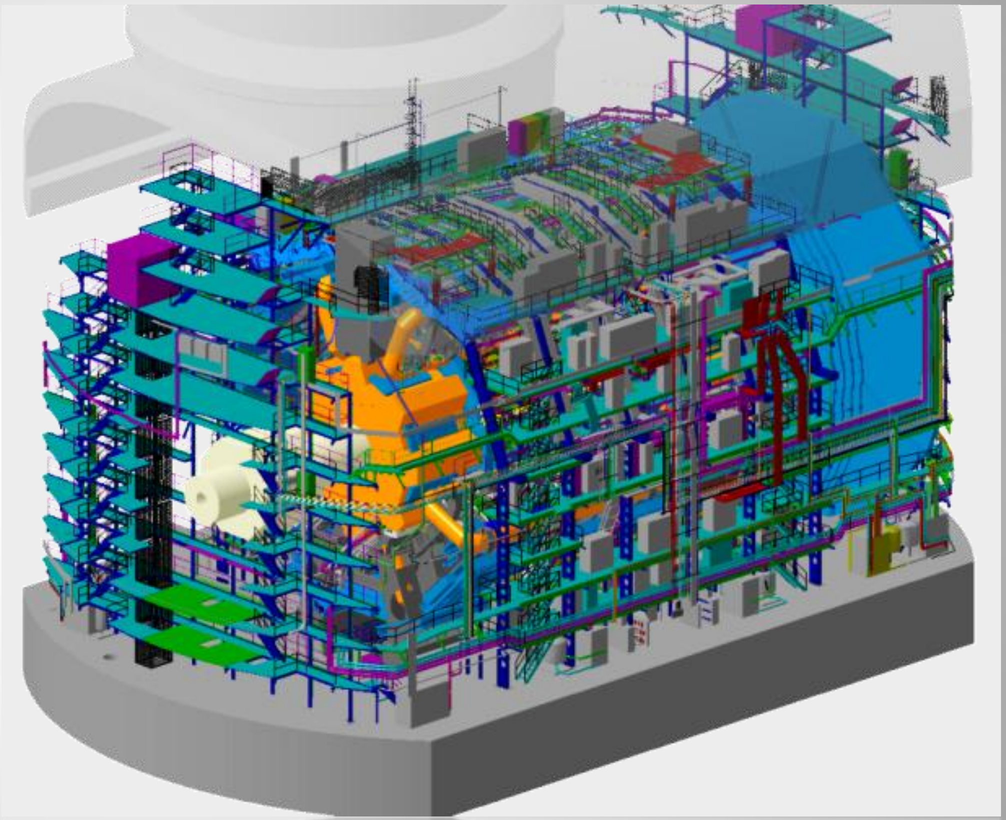
SmarTeam Data Base



Local Data Base created by GCEEC

ATLAS Detector V1

ATLAS V1



3'705 big assemblies with 32 GB data.

It contains more than 10'000'000 functional elements

ATLAS V1 Structure

- **B** - Beam Vacuum
- **I** - Inner Detector
- **A** - LArg Calorimeter
- **L** - Tile Calorimeter
- **T** - Toroid Magnets
- **M** - Muon Spectrometer
- **J** - Sheildings
- **S** - Services
- **H** - Support Structure
- **P** - Temporary Structure
- **F** - Infrastructure

- **AB** - LArg Barrel Cryostat
- **AE** - LArg End-Cap Cryostat

- **LB** - Tile Barrel Calorimeter
- **LE** - Tile Extended Calorimeter

- **TB** - Barrel Toroid
- **TE** - End-Cap Toroid

- **MB** - Barrel Brackets & Rails
- **MC** - Chambers
- **MA** - Alignment

- **SB** - Barrel Calorimeter
- **SE** - Extended Calorimeter
- **SM** - Muon Spectrometer
- **SR** - Racks, Cable Trays
- **SG** - Gas
- **SO** - Cooling

- **HX** - Access Structure
- **HB** - Feet and Rails
- **HT** - Truck
- **HM** - Structure

- **FC** - Cavern Cranes
- **FB** - Civil Engineering
- **FV** - Heating & Ventilation
- **FX** - Cryogenics
- **FE** - Electrical Distribution
- **FH** - Structures
- **FO** - Others

- **TBC** - Cryoring
- **TBW** - Warm Structure
- **TBV** - Vacuum Vessels

- **MCB** - Muon Barrel Chambers
- **MCE** - Muon EC Chambers
- **MCEE** - EIL4

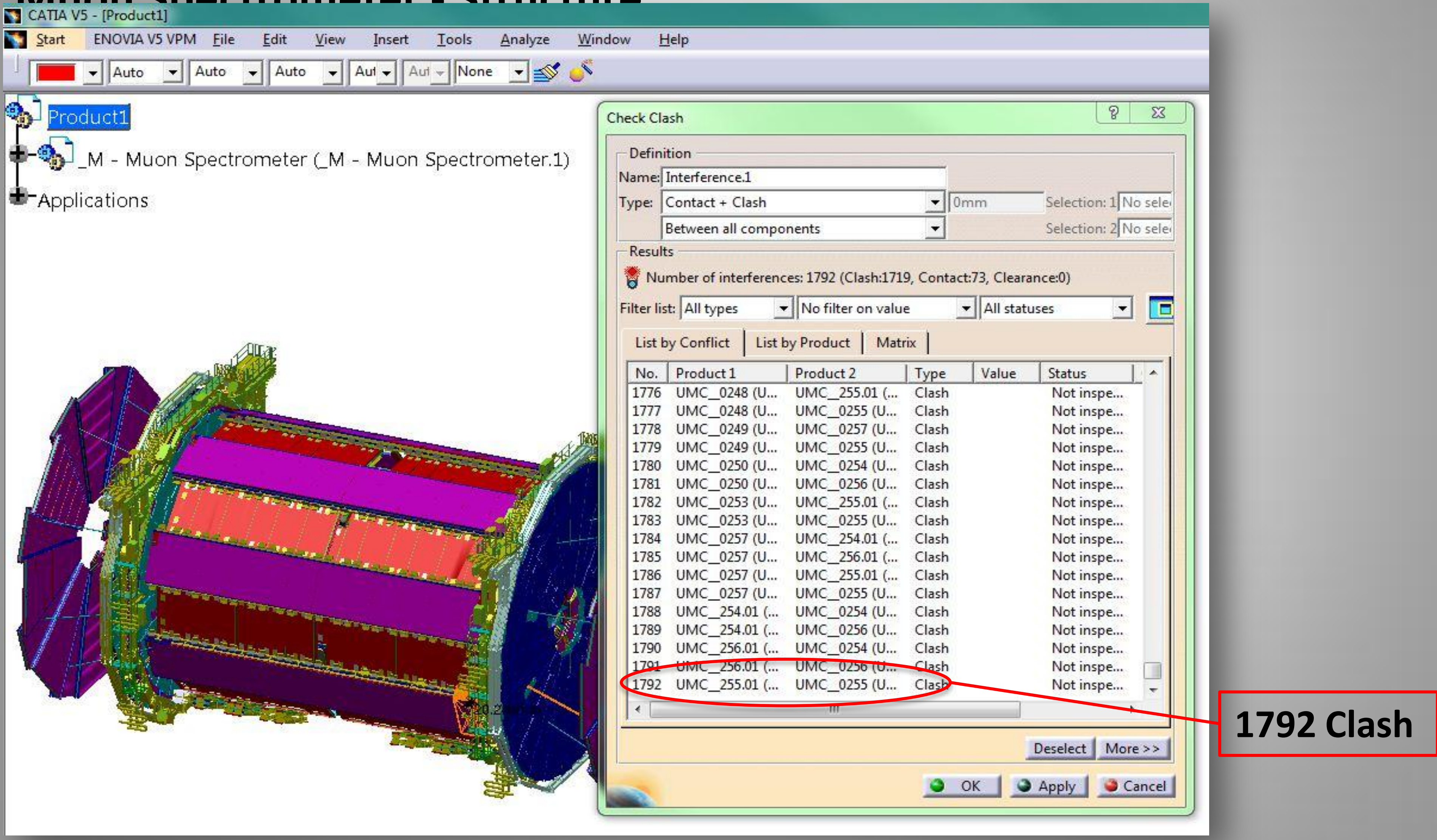
- **MAB** - Barrel Projective Alignment
- **MAE** - EC Alignment
- **MAR** - Barrel Reference Alignment

- **HTR** - Run Position
- **HTA** - Access Position

- **FHO** - HO Structure
- **FHS** - HS Structure
- **FHT** - Central Trench Structure
- **FHM** - HM Structure

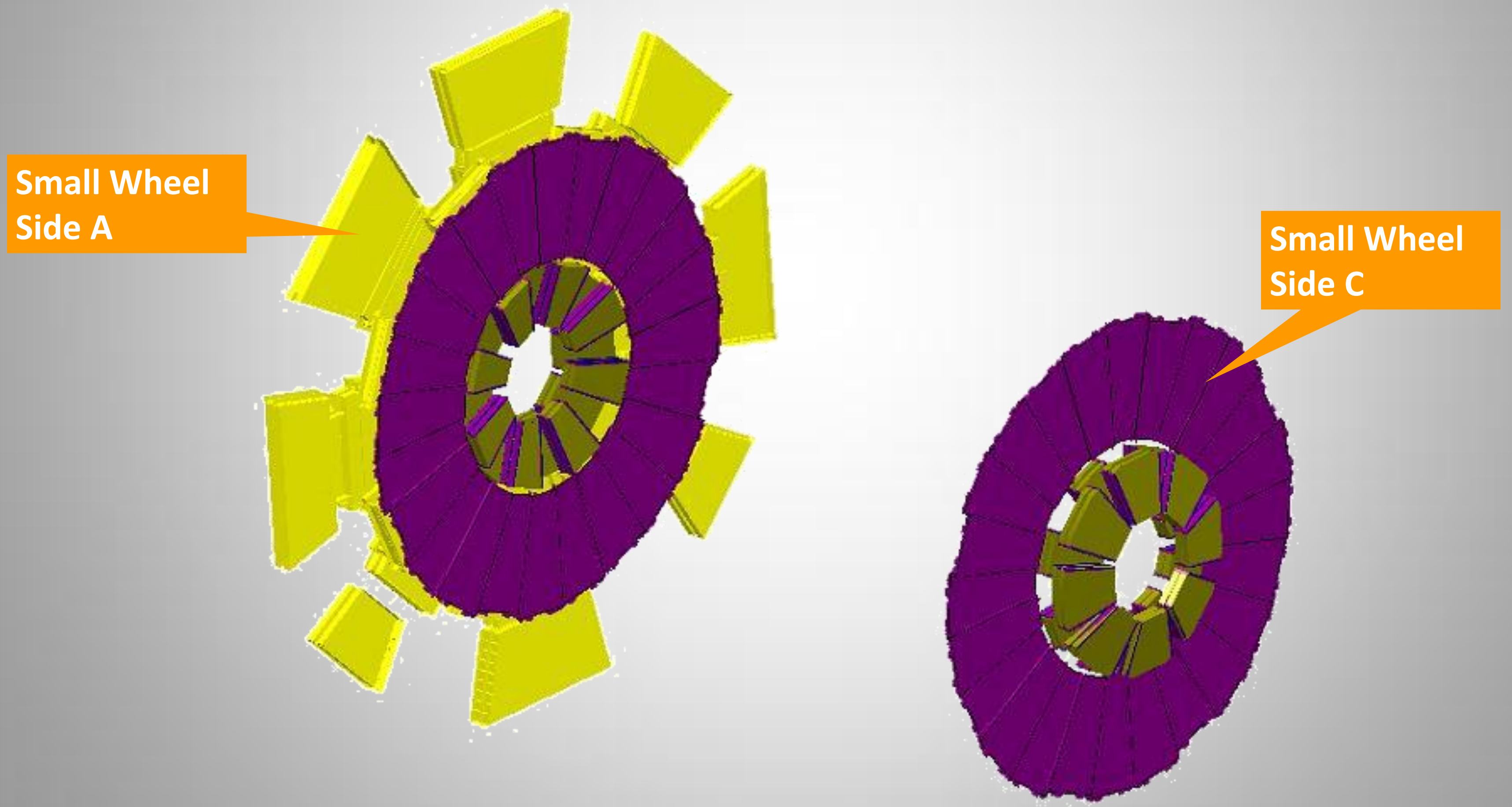
Atlas V1 Local Data Base

Muon Spectrometer - Structure



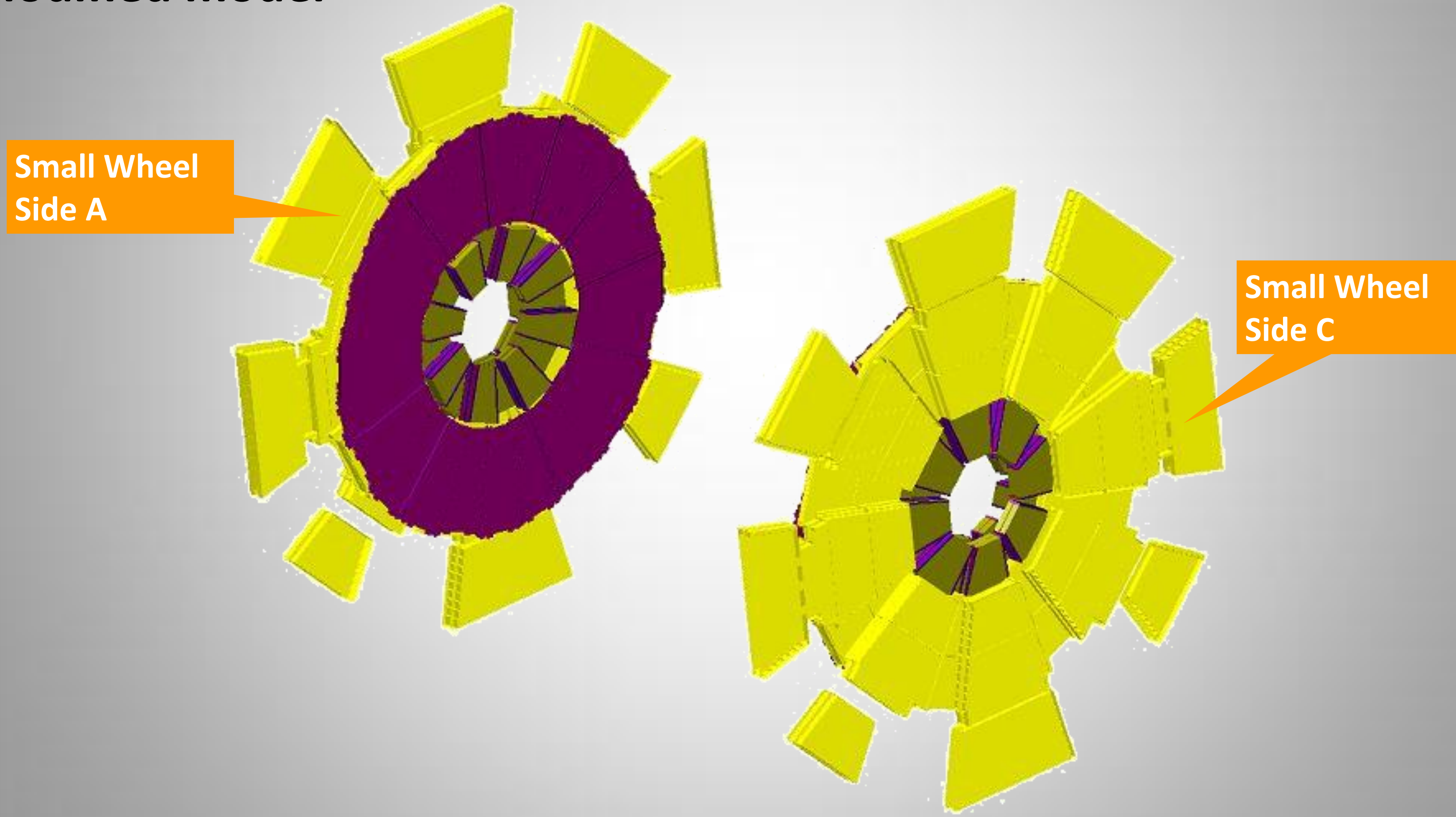
Atlas V1 Local Data Base

Missed parts



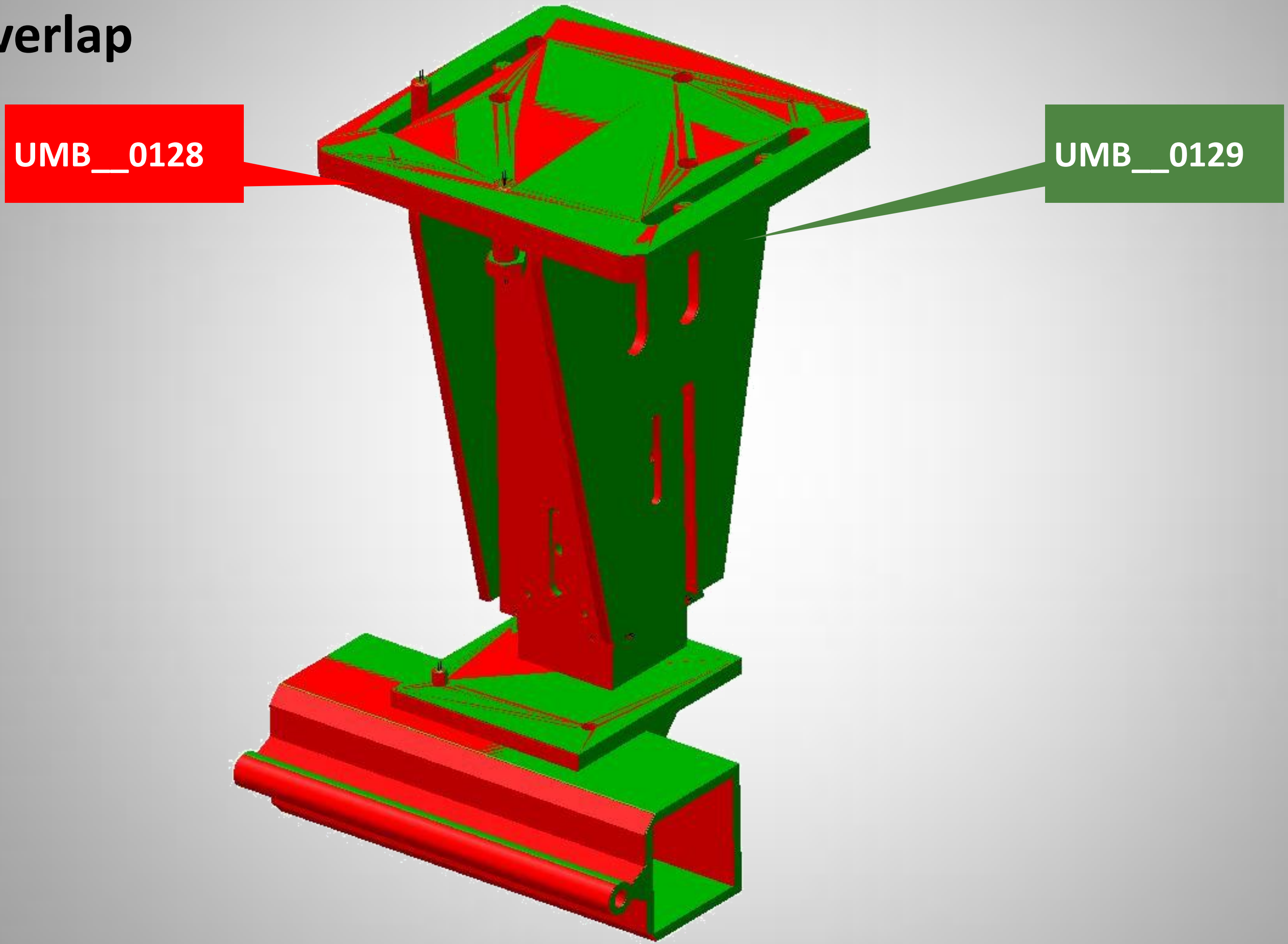
Atlas V1 Local Data Base

Modified model

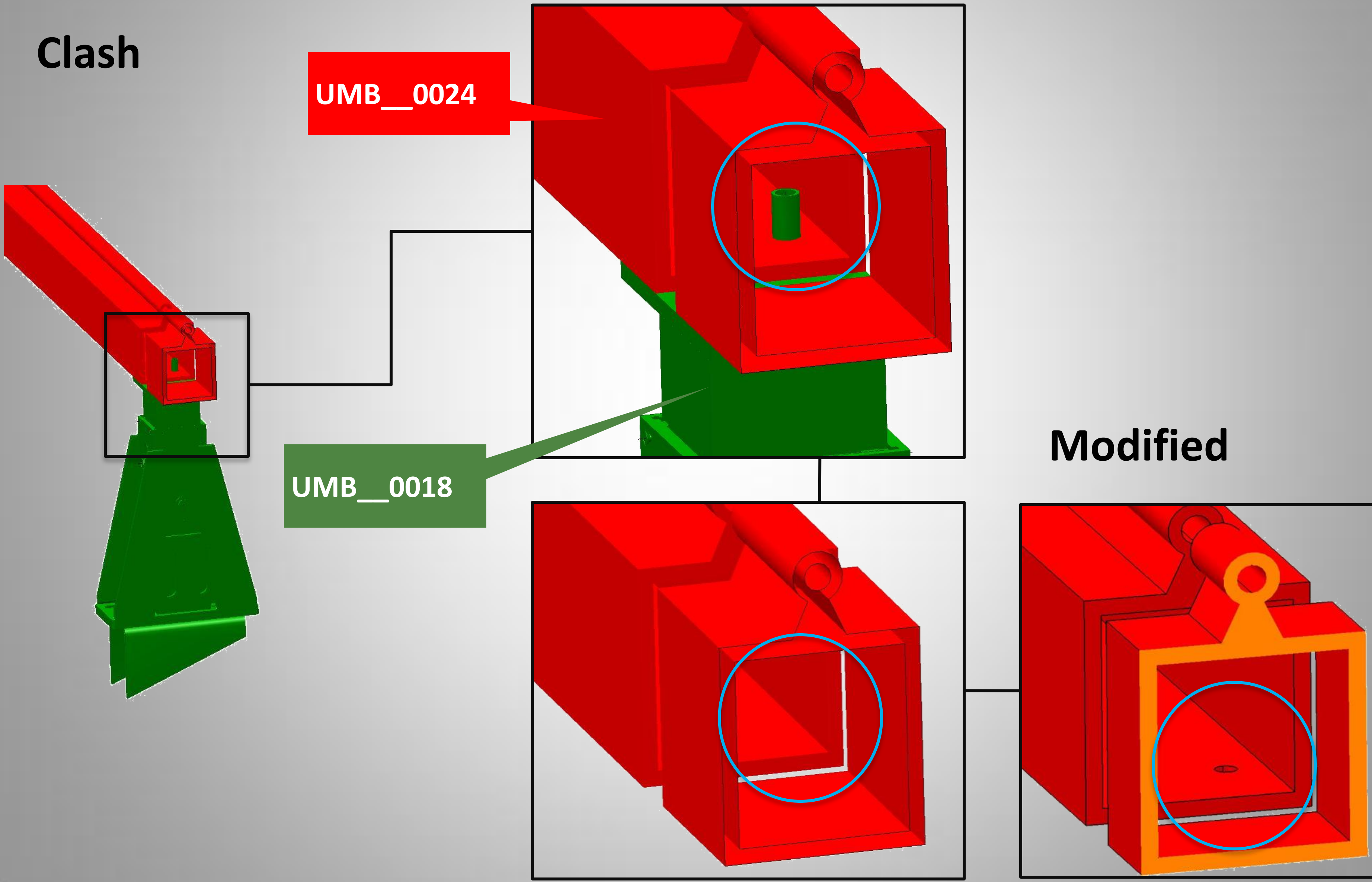


Atlas V1 Local Data Base

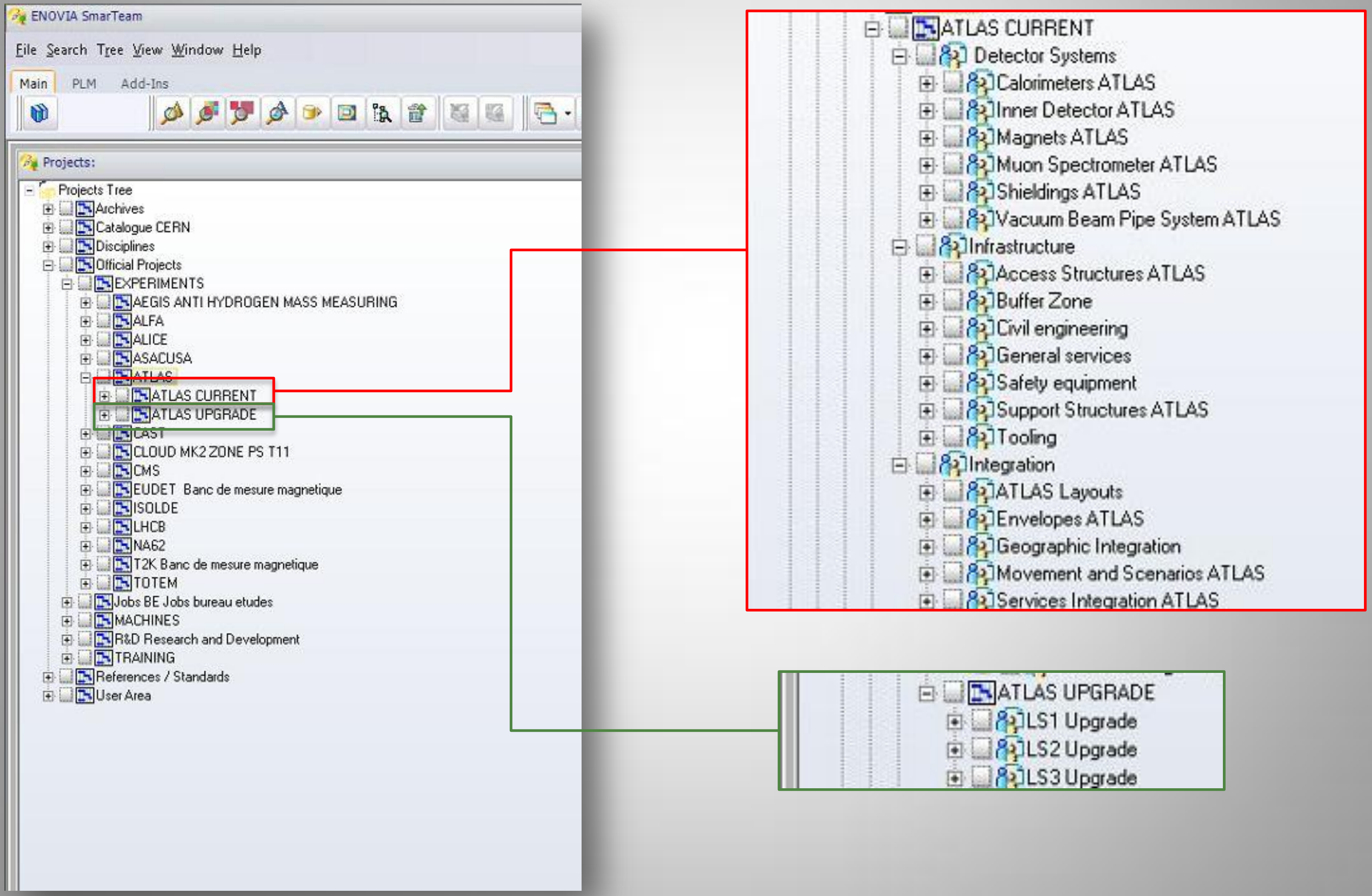
Full Overlap



Atlas V1 Local Data Base



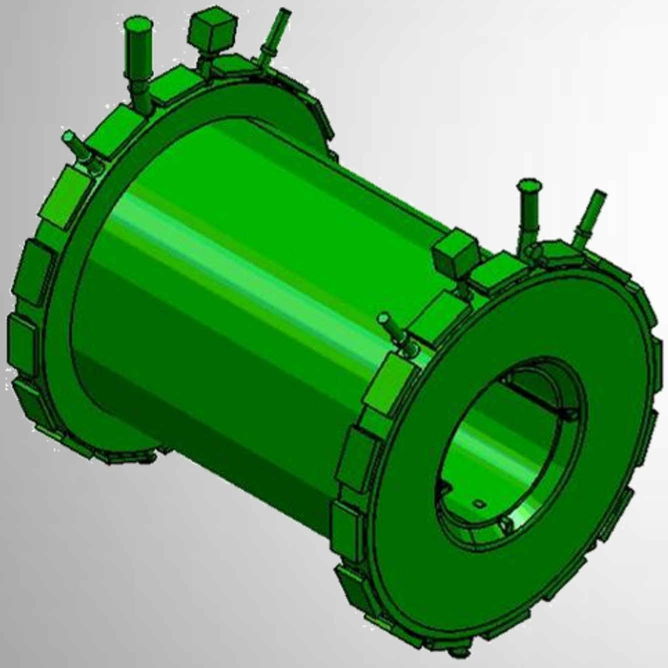
Atlas Data Base Structure on Smarteam



SmarTeam Data Base

Same models, but different names

CAD000138493



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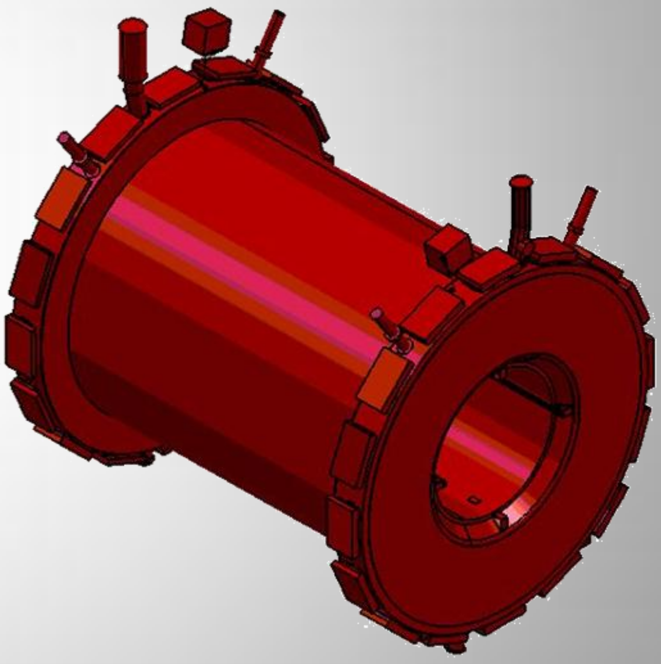
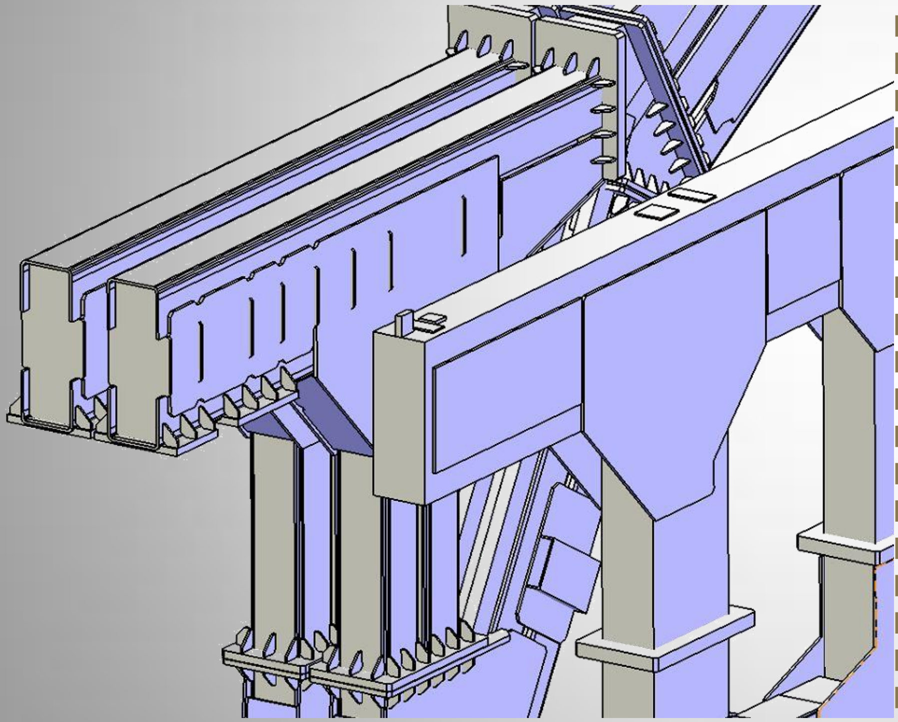


SmarTeam Data Base

Big Wheel Support

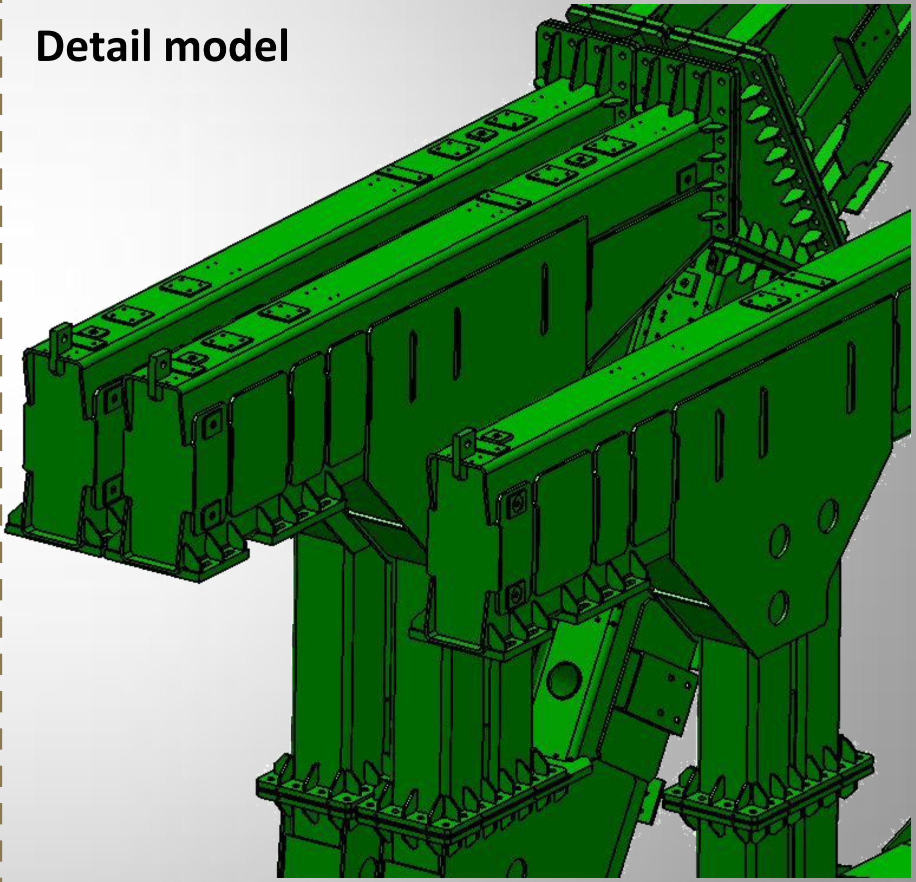
Smarteam

Simplified model



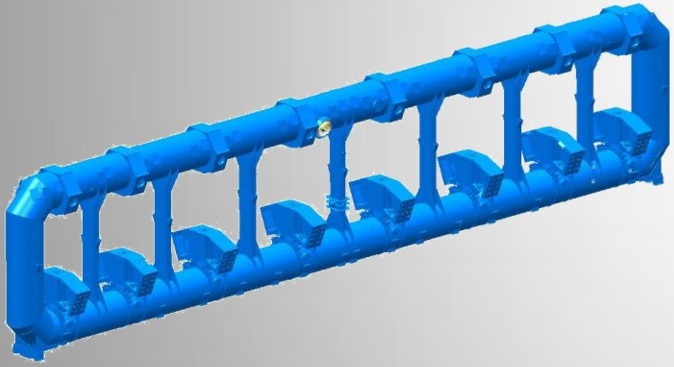
Atlas V1 Local Data Base

Detail model



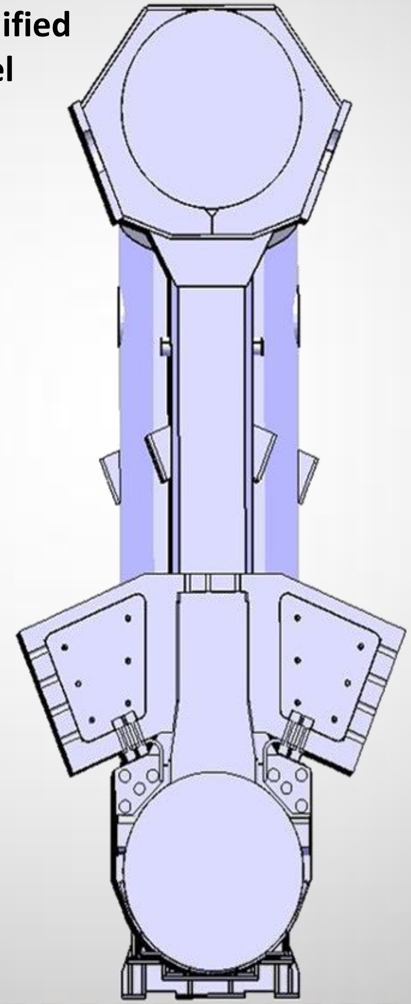
SmarTeam Data Base - TB Coil

Coil



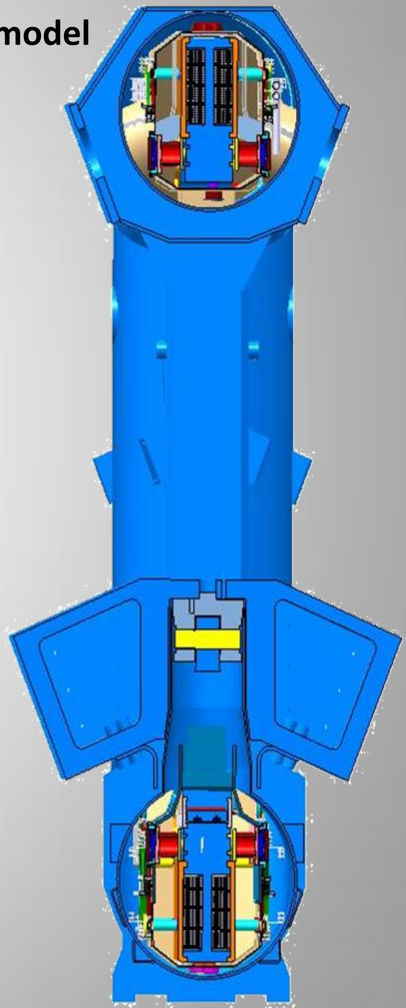
Smarteam

Simplified model



Atlas V1 Local Data Base

Detail model



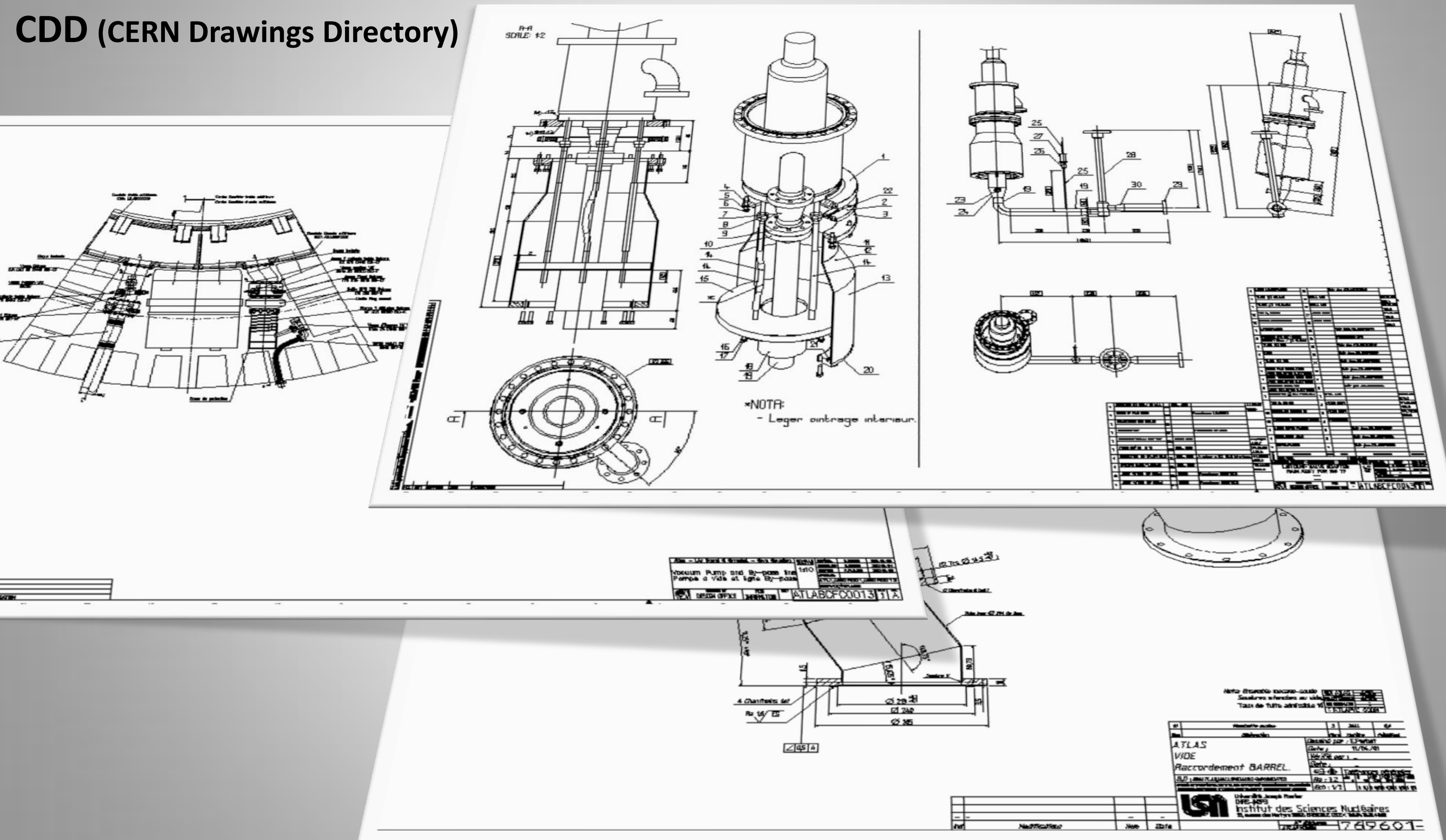
Reference Geometry in CATIA

Level 1 | Level 2 | Level 3 | Level 4

- D - Detector Comp.
  - DC - Calorimeter
    - DCA - Larg Calorimeter
      - DCAB - LArg BR Cryost.
      - DCAE - LArg EC Cryost.
    - DCL - Tile Calorimeter
      - DCLB - Tile Barrel Cal.
      - DCLE - Tile Ext. Cal.
  - DI - Inner Detector
    - DIB - Barrel
    - DIC - Cryostat
    - DIE - EndCap
    - DID - ID and Plates
    - DIP - Pixel
  - DT - Magnets
    - DTM - Toroid magnets
      - DTMB - BR Toroid Mg
      - DTME - EC Toroid Mg
    - DTS - Solenoid Magnet
  - DM - Muon Spectrm.
    - DMB - BR Chambers
    - DMF - Forward Muon
      - DMFE - EE Chambers
      - DMFI - EI Chambers
      - DMFO – EO Chambers
    - DMS - Small Wheel
    - DMW – BW Chambers
  - DJ - Sheildings
    - DJF - Forward Shield.
    - DJM – JM/JD
    - DJ T - JTT
  - DB - Beem Vacuum

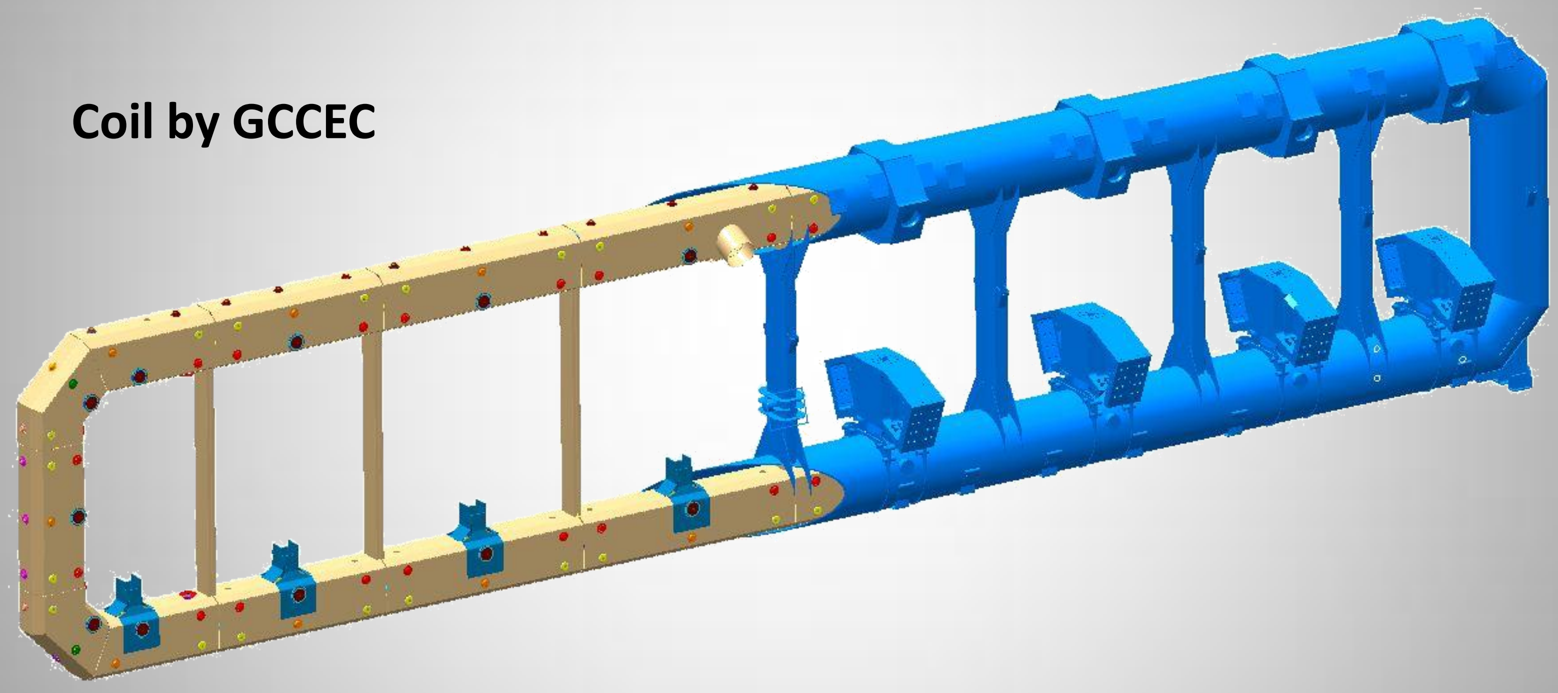
Reference Geometry in CATIA

CDD **(CERN Drawings Directory)**



Reference Geometry in CATIA

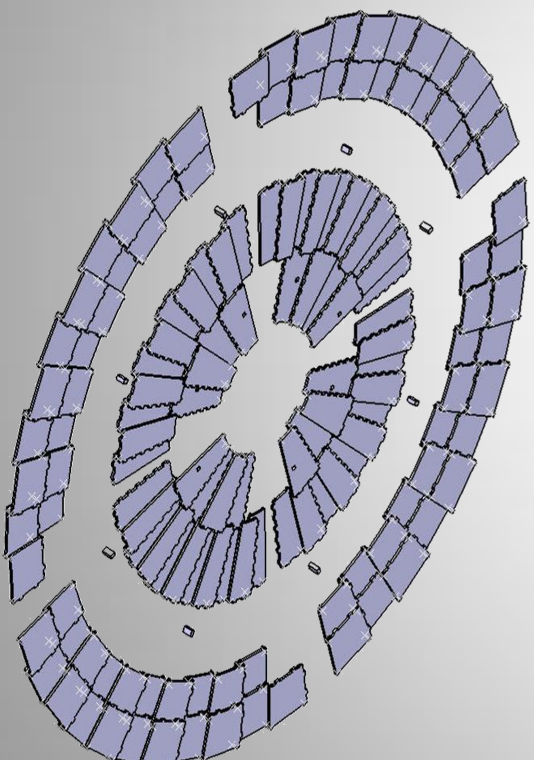
Coil by GCCEC



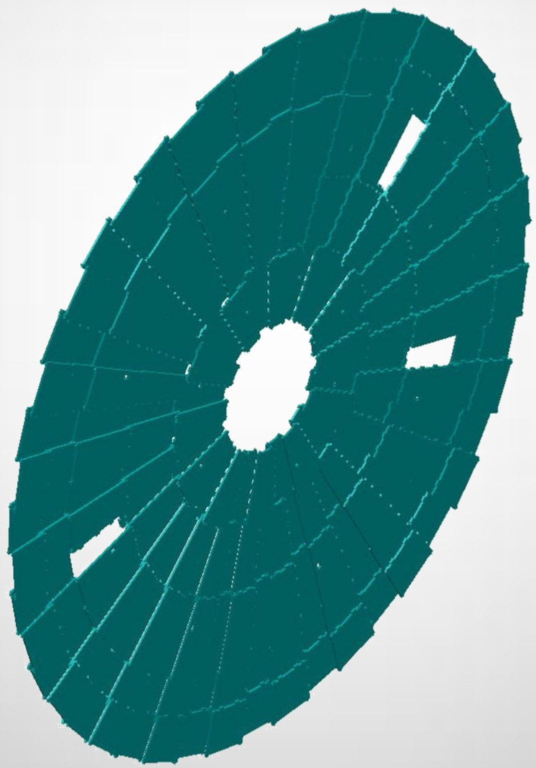
Reference Geometry in CATIA

Compare between SmarTeam and Atlas V1 models

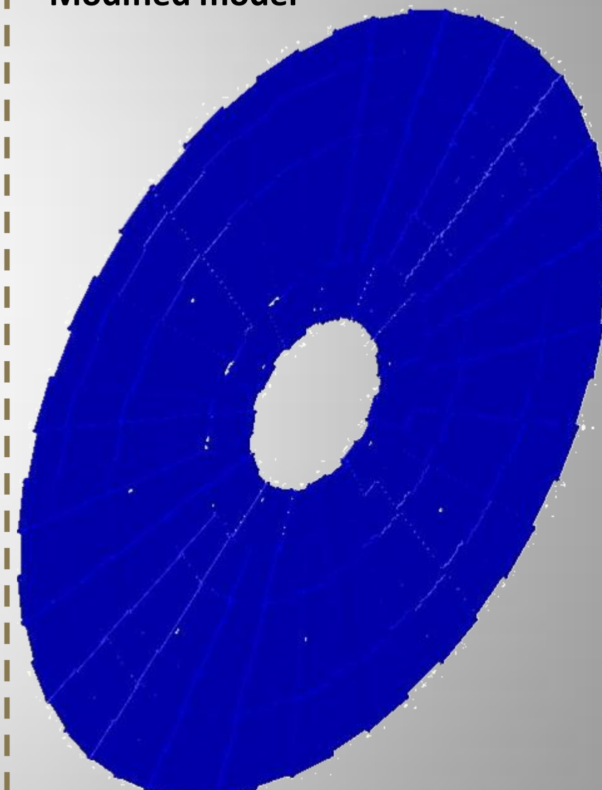
SmarTeam Model



ATLAS V1 Model



Modified model



Conclusion

our aim is for creating new improved database of Atlas detector for existing improved database of Atlas because this geometry is used in different projects:

- For comparing already existed geometry of simulation project.
- For adding new geometry (volumes) in simulation project. Especially in support and services
- For Initialization and upgrading of Atlas detector by Atlas technical group

Thank you for Attention

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