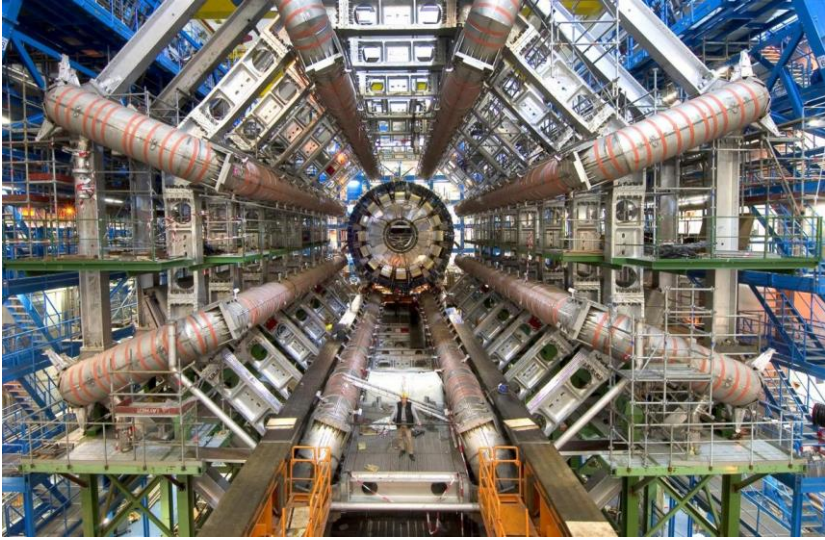


Georgian Technical University
Nuclear Engineering Center

Analysis of Geometric Components of ATLAS Detector for Synthesis of Reference Descriptions

Dr Archil Surmava

CERN Cognitive Festival
24th October 2018



ATLAS Detector

60'000 Assemblies

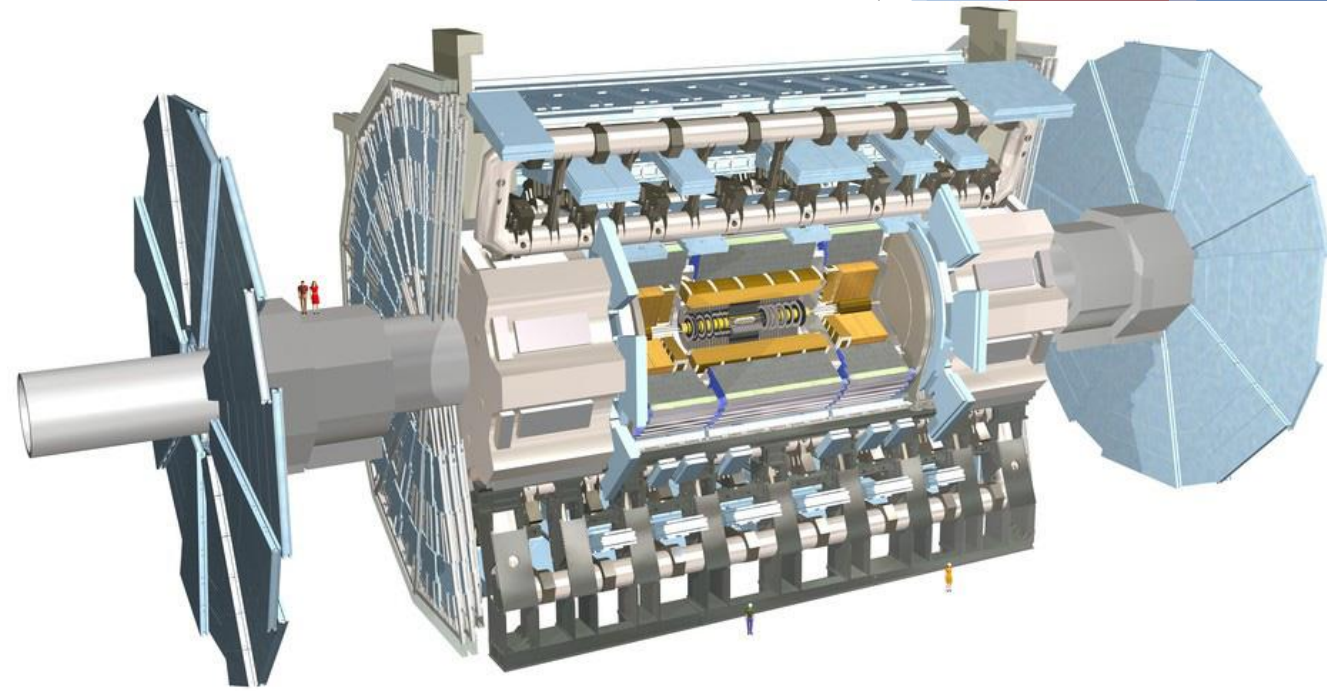
1'000'000 functional elements

3D Geometric Modeling



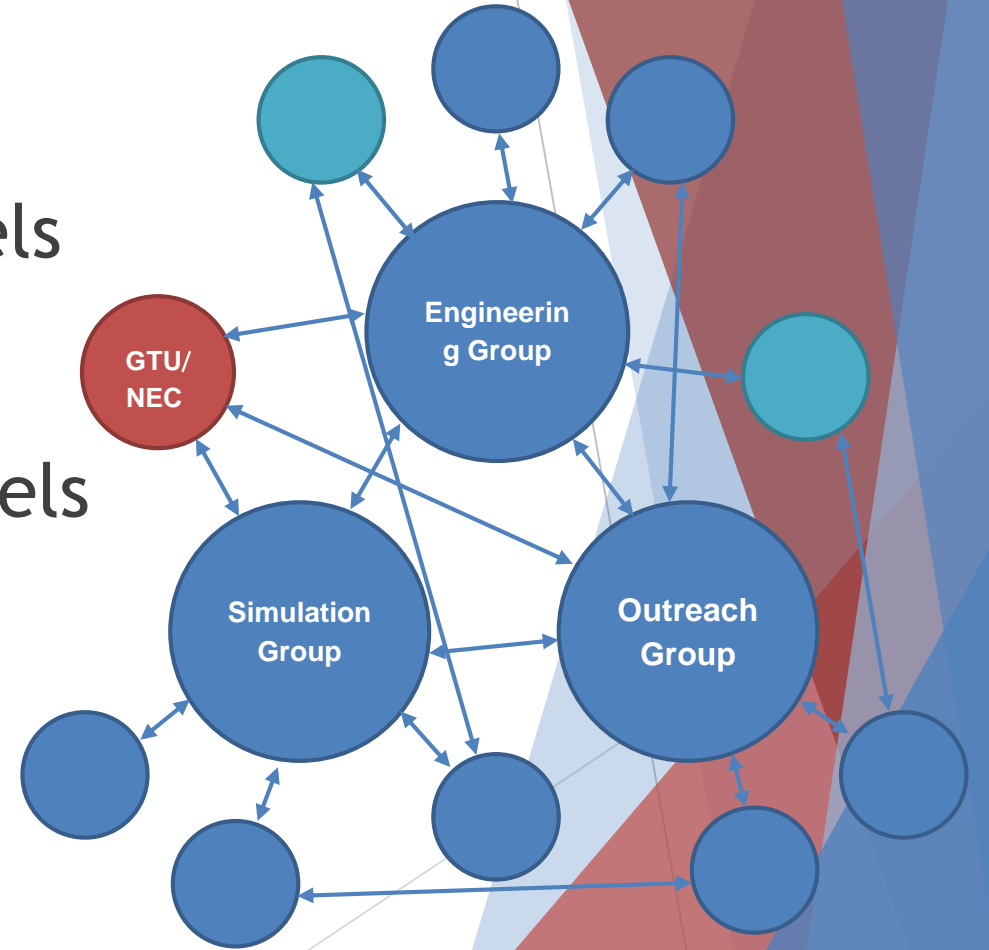
Information

- ▶ Geometrical
- ▶ Technical
- ▶ Physical



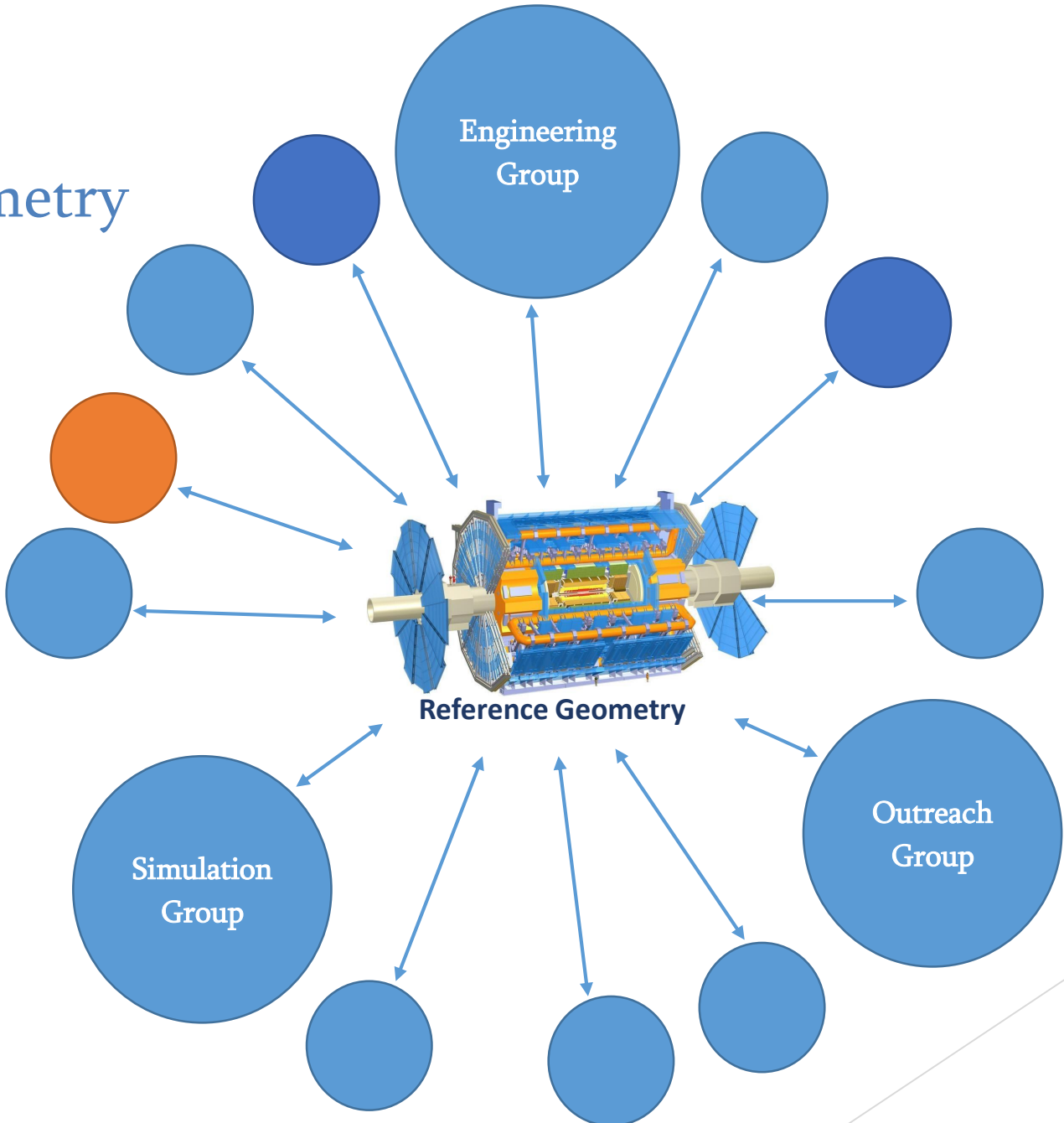
Heterogeneous 3D geometric model

- ▶ Need of huge human capacity
- ▶ Inaccurate nature of 3D geometric models and wrong interpretations
- ▶ Difficulty of updating 3D geometric models

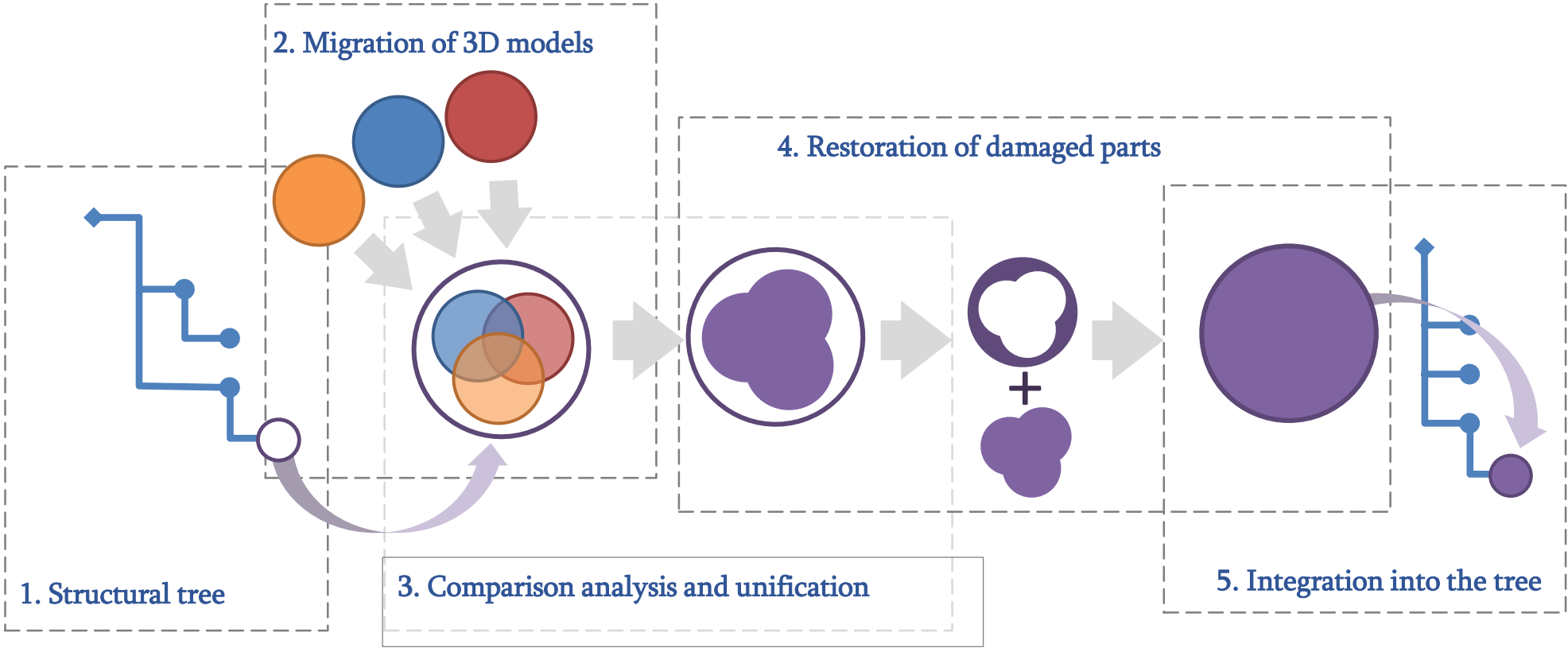


ATLAS

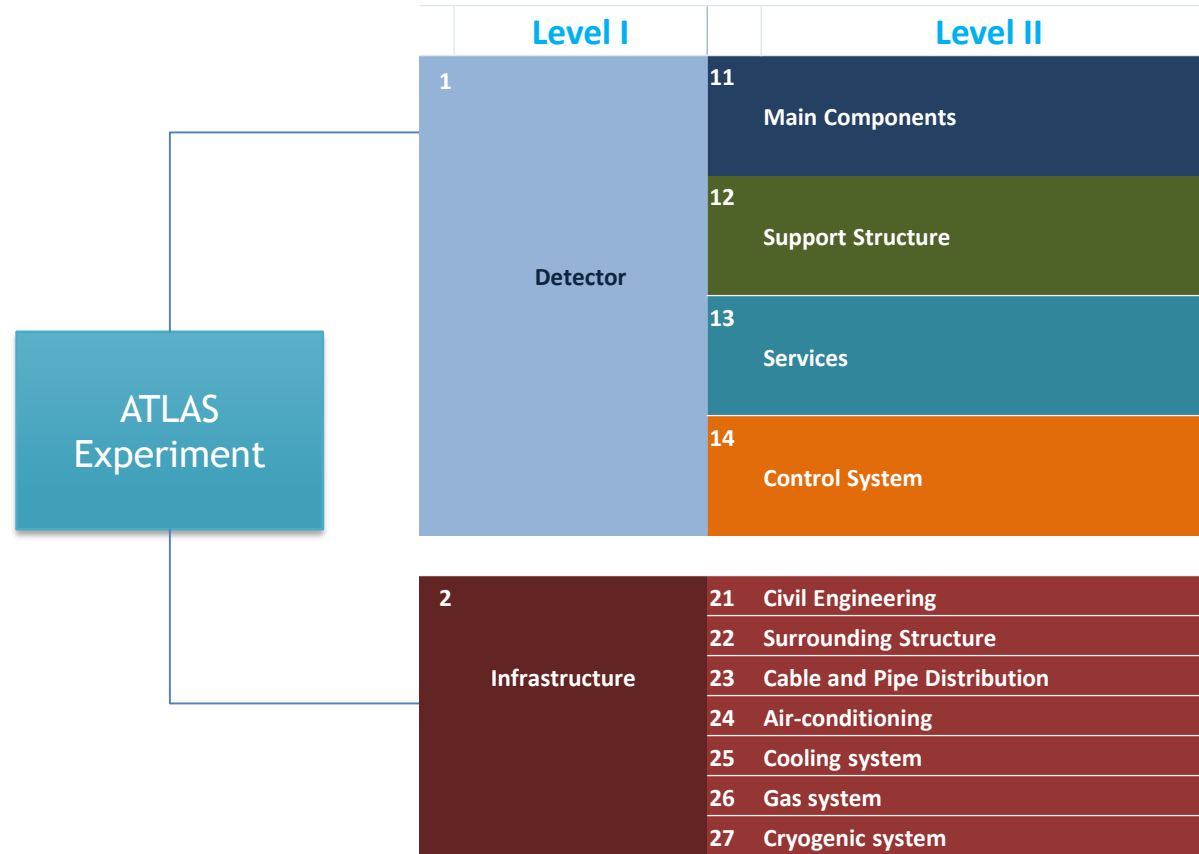
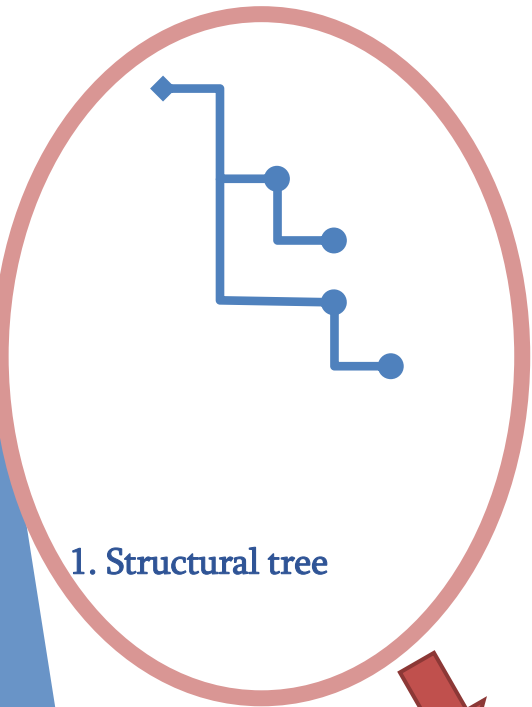
Reference Geometry



5-step research



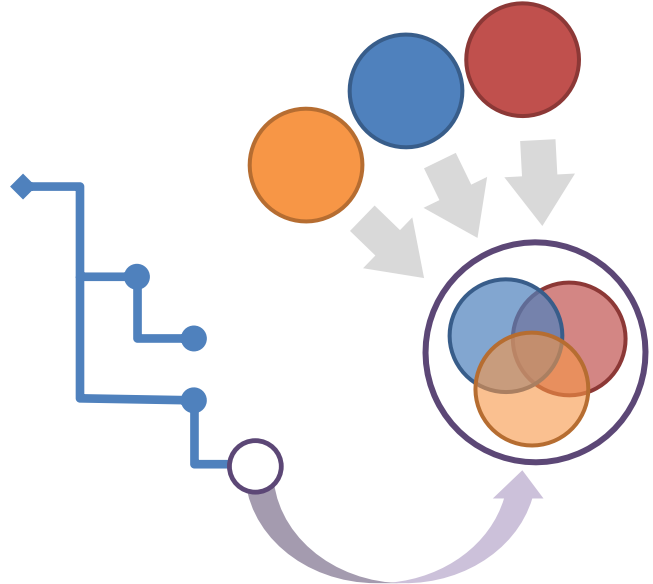
1 step: Structural tree



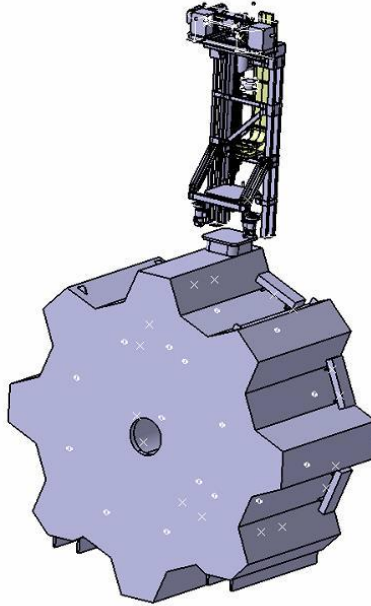
ATLAS detector structure was described by 8-level hierarchical tree, where 207 classes and 247 objects were separated

II step: Migration of 3D models

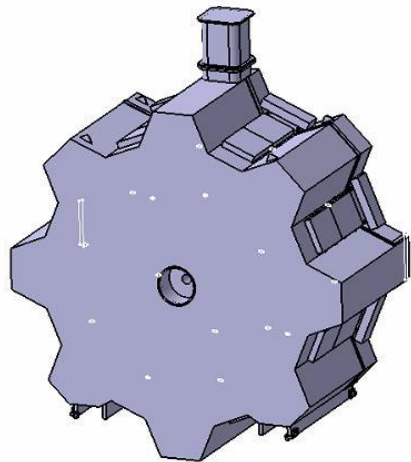
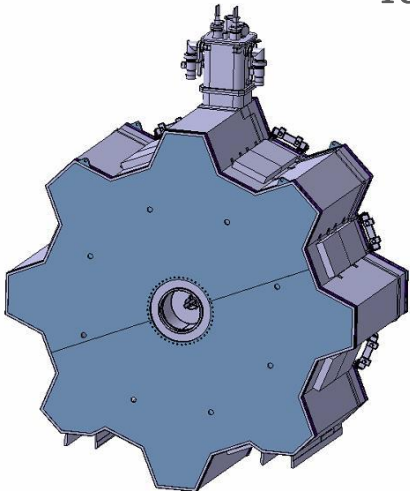
2. Migration of 3D models



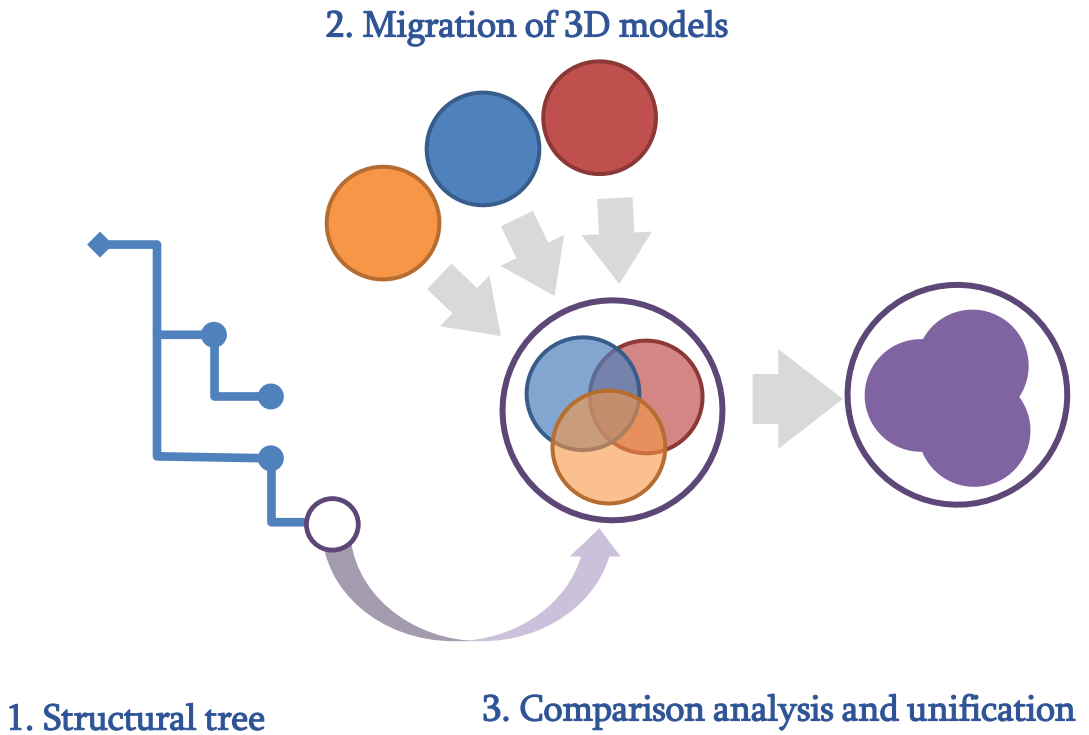
1. Structural tree



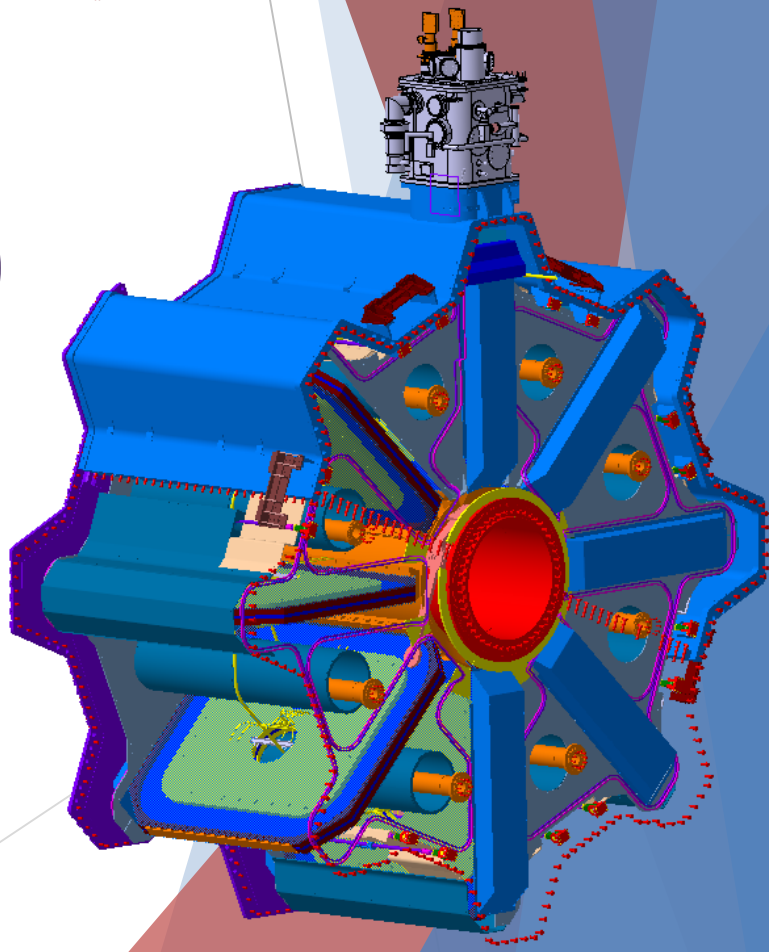
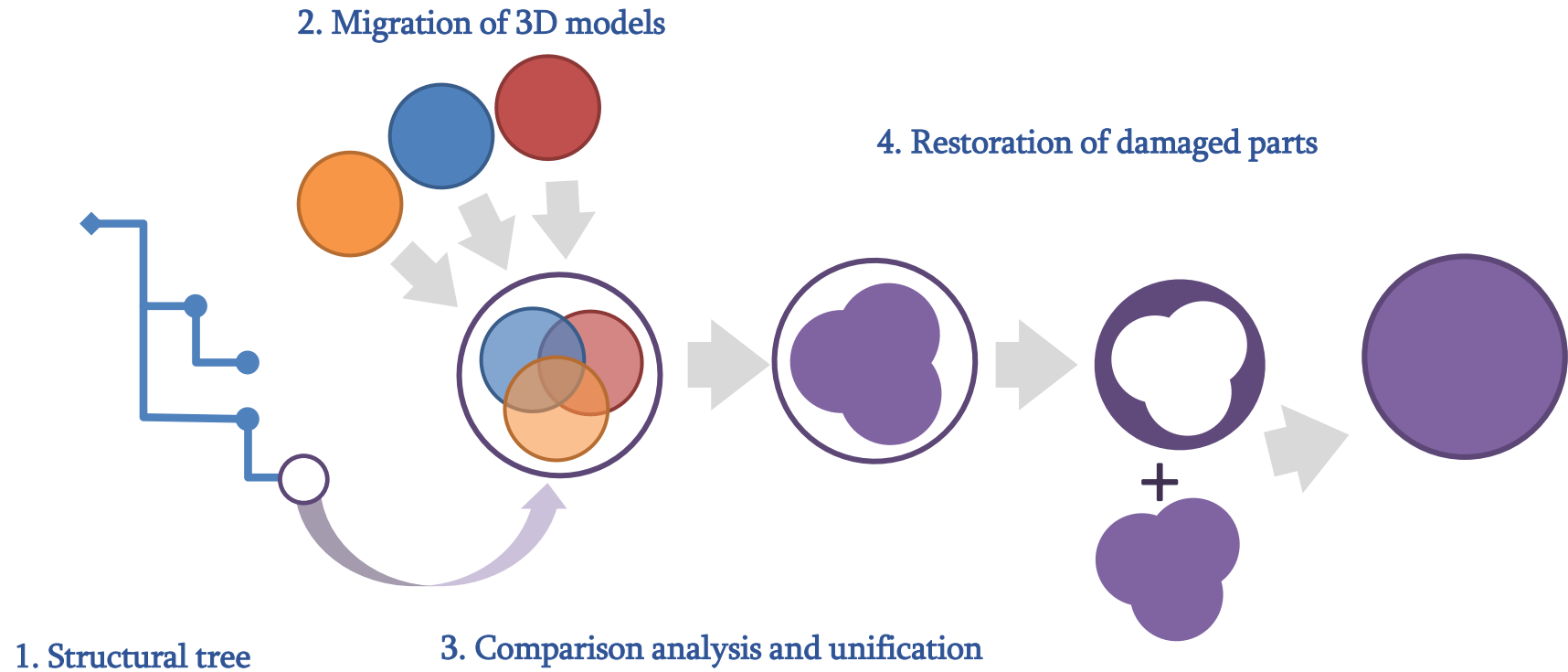
Three different models of Toroid Magnet



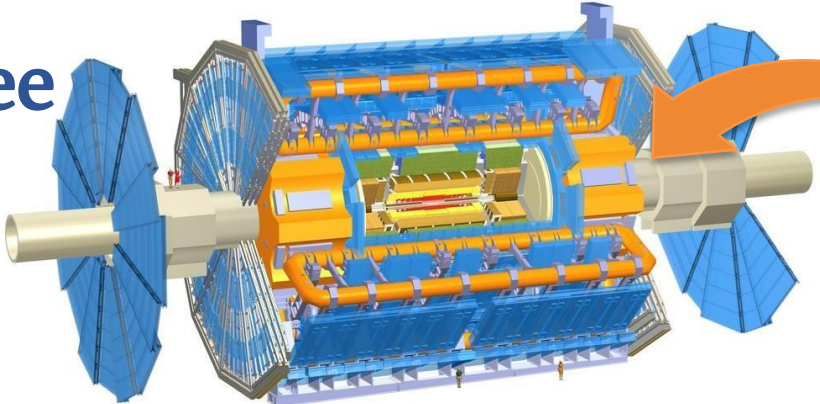
III step: Comparison analysis and unification



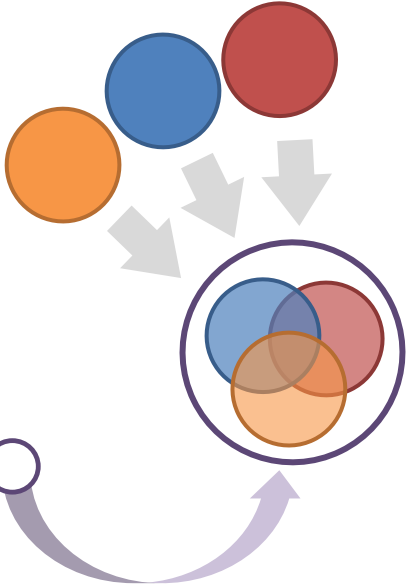
IV step: Restoration of damaged parts



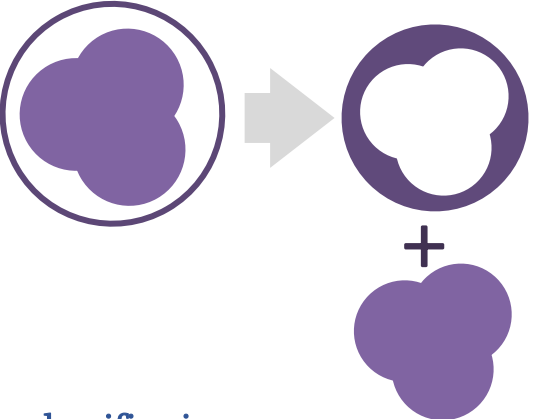
V step: Integration into the tree



2. Migration of 3D models



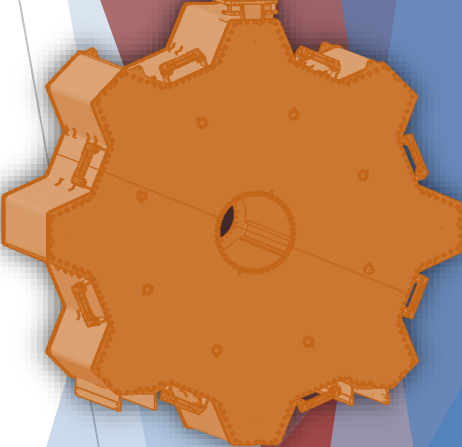
4. Restoration of damaged parts

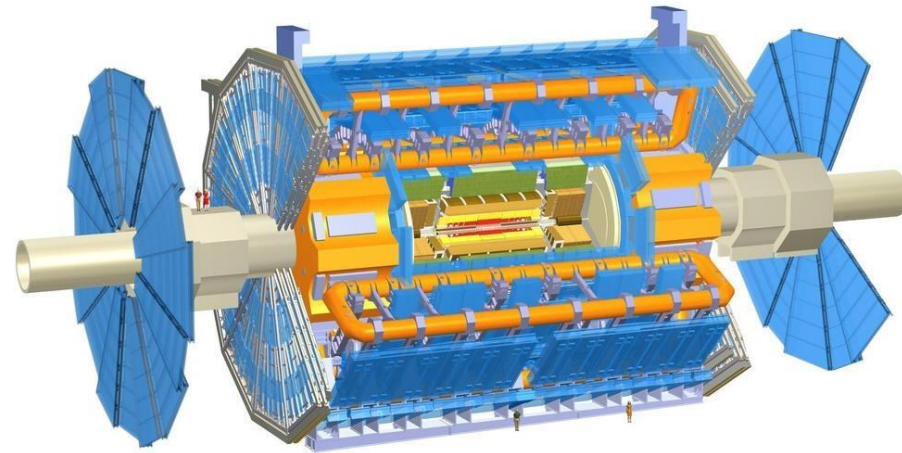


1. Structural tree

3. Comparison analysis and unification

5. Integration into the tree





Thank you for your attention