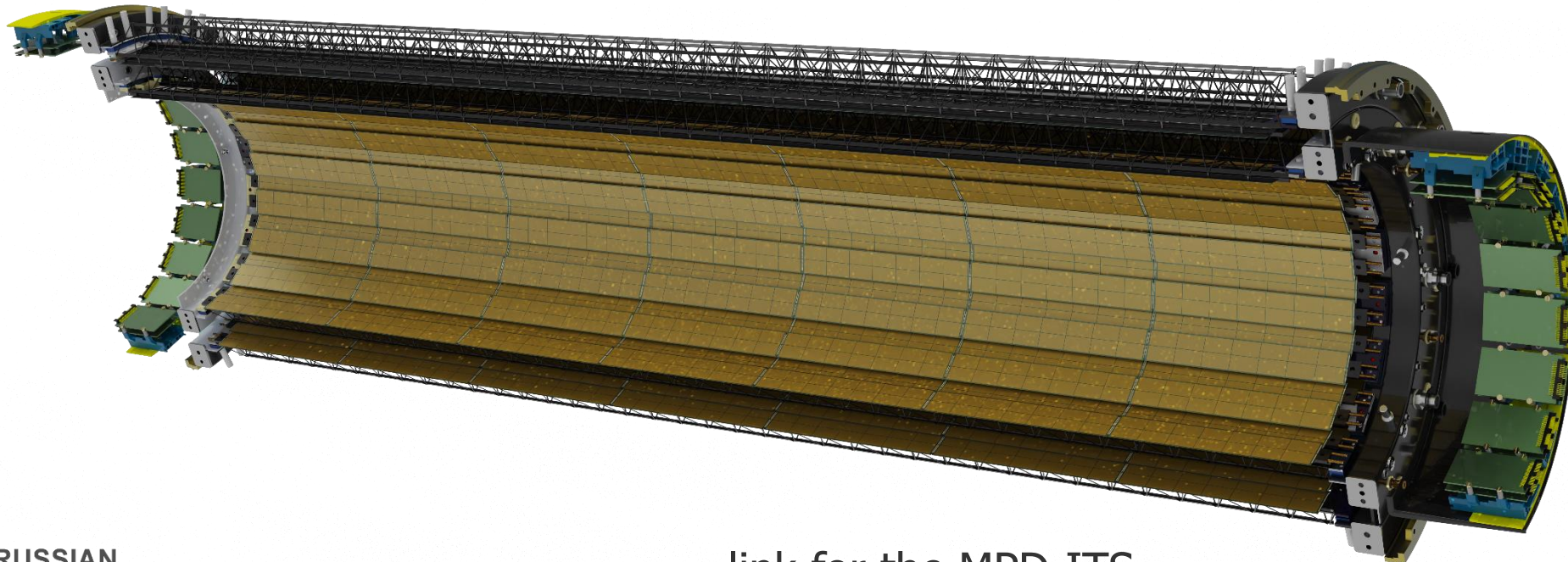


Status of mechanics for the Beampipe, FFD and ITS

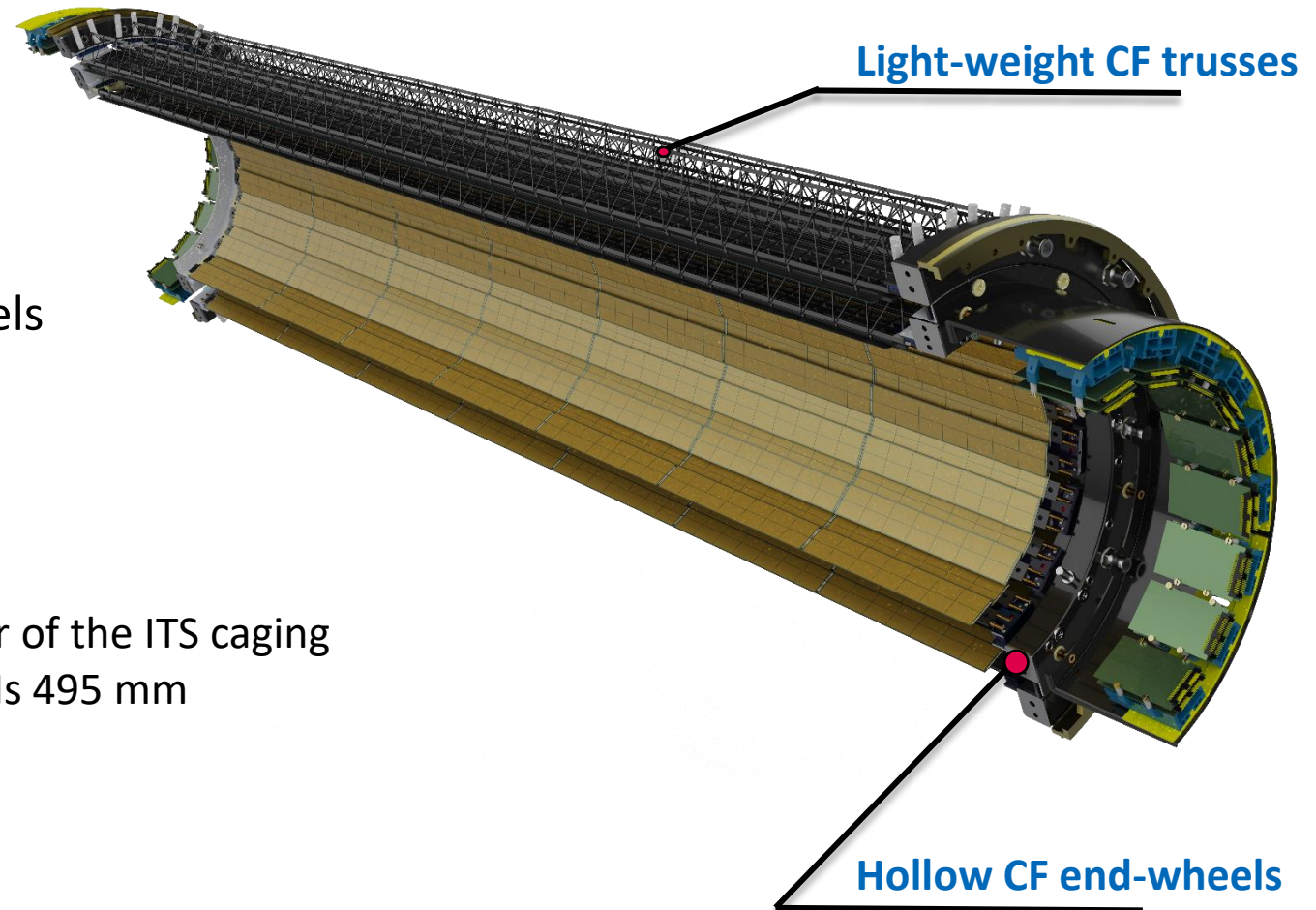
Yuri Murin, JINR



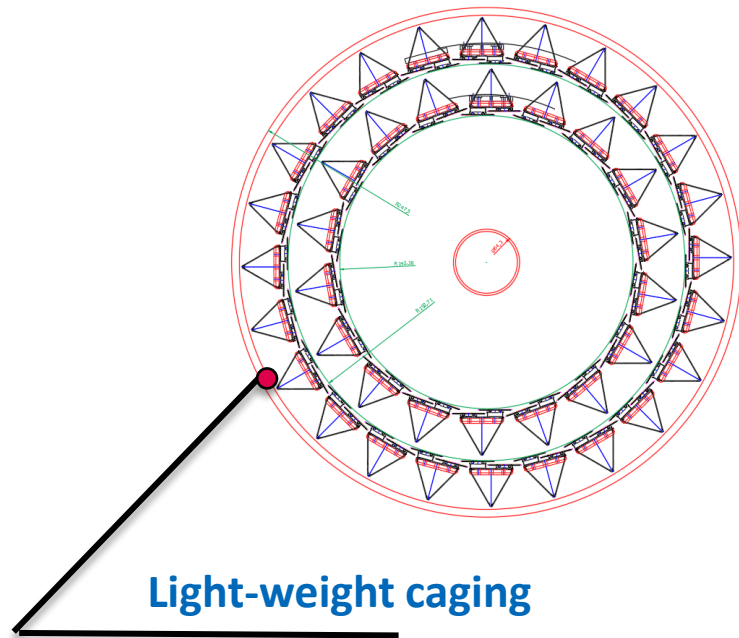
- **The MPD ITS in brief**
- **Problems with installation and the IC solution to those**
- **Scenario of integration of the IC**
- **Status of the design and production of essential parts**
- **The IC mock-up plan**
- **Tentative timelines for completion**

The OB as the goal of the first stage of the ITS project

- Two Outer Barrel 2 layers composed of 42 staves each carrying 196 ALTAI MAPS of 15x30 mm² size
- Radial position (mm): 145, 195;
- Length in Z: 1475 mm;
- Layer 4: 18 STAVES / Layer 5: 24 STAVES
- 8232 MAPS cover 3,7 m² with 4'316B pixels



Diameter of the ITS caging
Is 495 mm

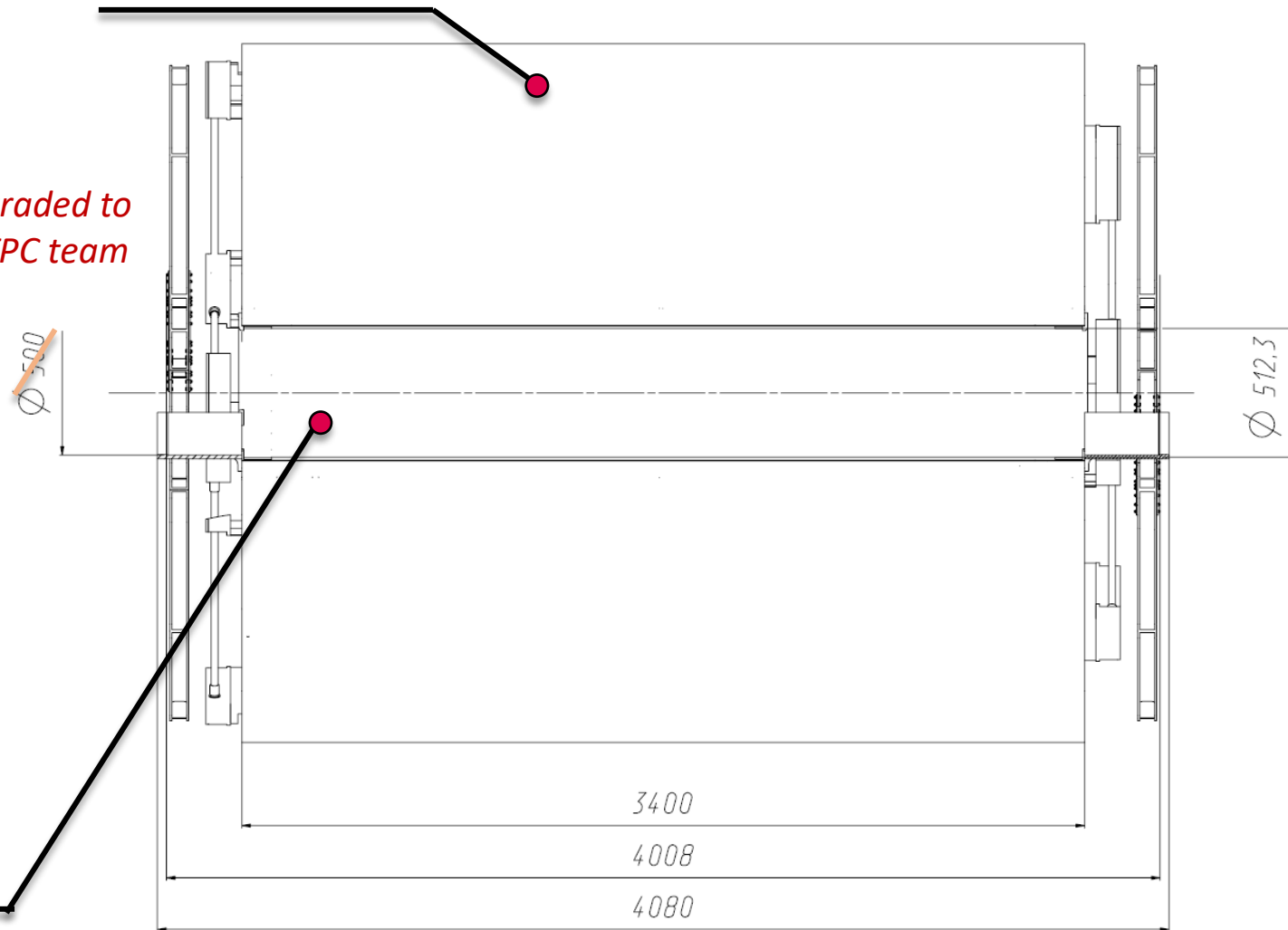


The **clearance** between the ITS installation container in the TPC detector is **only 4.5 mm !**

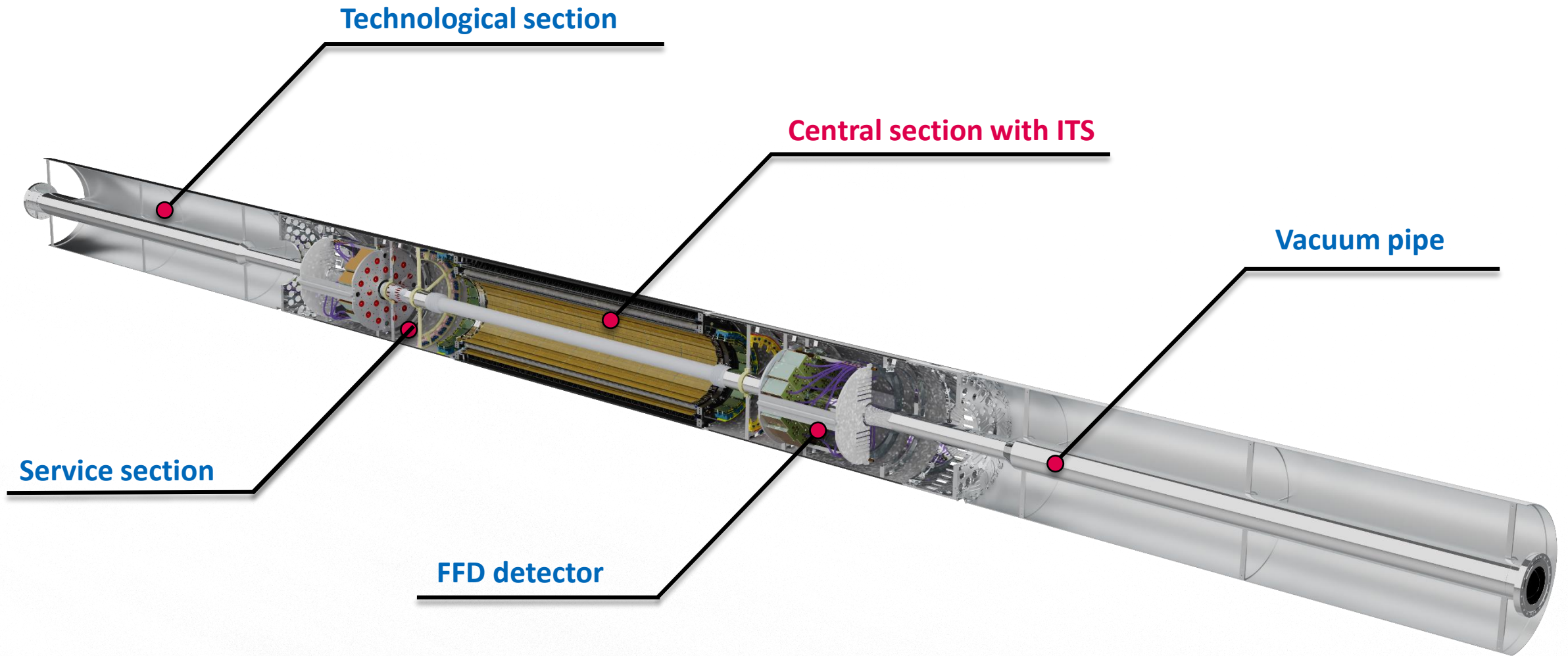
Initial 500 mm diameter was traded to 504 mm with TPC team

TPC bore

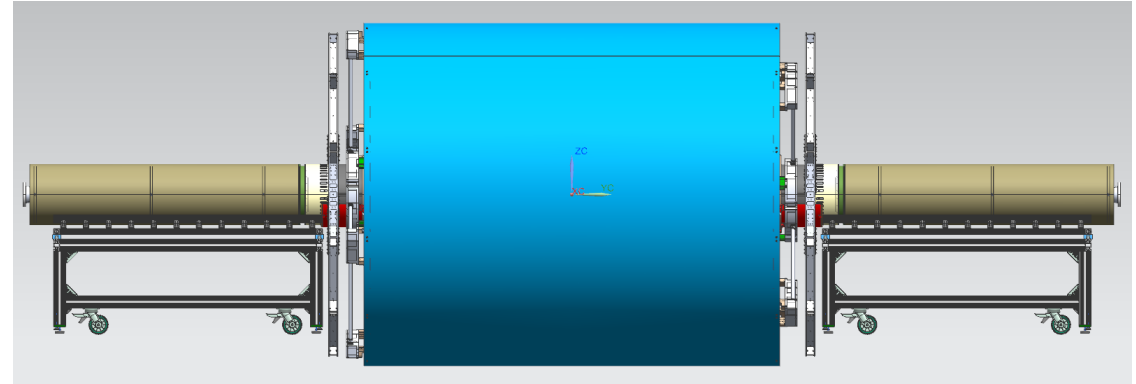
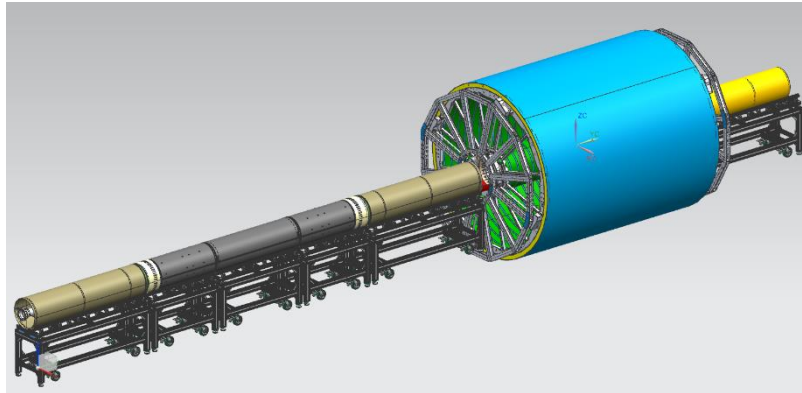
The TPC sensitive volume



The IC structure with all inside parts of TPC



Basic idea for integration all TPC inside parts (*Sergey Igolkin*)



- Mount preliminary tested BP filled with dry nitrogen, two FFDs and bottom half of the ITS with all cooling arteries and cables into the bottom shell of the IC on auxiliary adjusting tables with rollers;
- Mount the upper part of ITS with its arteries and cables into the upper shell of the IC ;
- Clamp the assembled upper part to the assembled bottom part of the IC;
- Test the functionality of the sensors inside;
- Roll-in the IC into the bore of TPC;
- Give room to vacuum team to connect the BP to the vacuum chamber of the collider.

- **Central section**
- **Service sections**
- **Technological sections**
- **Auxiliary devices**
- **Infrastructure preparations**

- **Two thin-wall half-cases:** carbon fiber sandwich with high accuracy embedded elements for positioning

Design completed



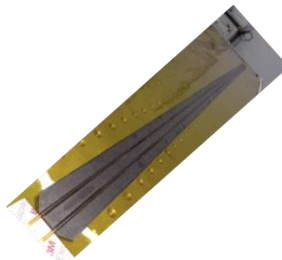
Design completed

Production on-going

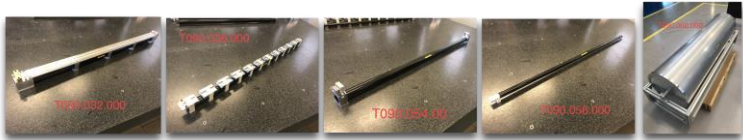
- **Four end-wheels:** carbon-fiber hollow half-ring shape acting as a manifold for gas system; high accuracy for positioning of support trusses

- **Support trusses and cold plates:** carry the sensors; join the end-wheels on opposite sides together

Production completed



- **Auxiliary equipment:** numerous for production and assembly

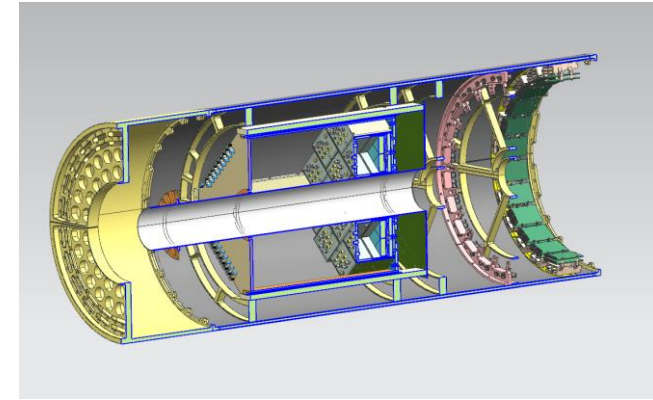


- **Infrastructure preparations:** workshop for CF parts lamination

Production completed

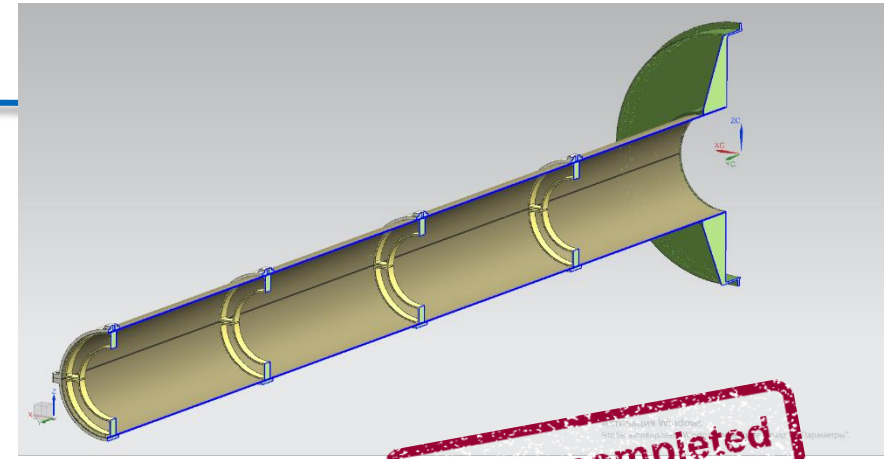
- Two CF and Two Al half-shells
- ITS cooling arteries with manifolds and fixtures
- ITS power and data cables with filter and fixtures
- Two punch panels with ITS power and data connectors
- Beam pipe supports
- Two heavy FFDs with power and data cables and fixtures

Design completed



Design on-going

- **Four Al half-shells** (to be dismantled after BP fix)
- **Four BP supports** (to be dismantled after BP fix)
- **Pieces of FFDs power and data cables** (to be rearranged during the Al half-shells dismantling)
- **Auxiliary jigs and fixtures for dismantling** (together with vacuum team)



Design on-going

Integration mock-up plan: parts needed

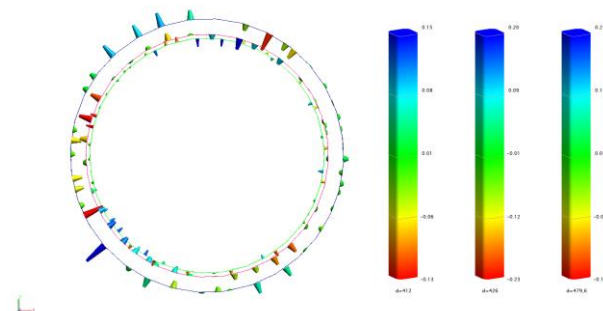
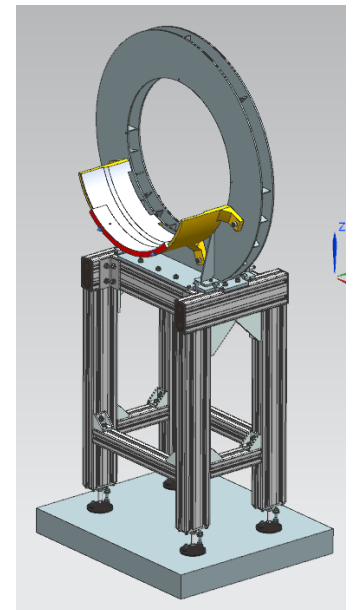
- Large area hall
- Roll-in assembly tables for Bottom Half-IC
- Assembly tables for Bottom Half-IC
- TPC bore mock-up (E.Serockin et al)
- Auxiliary jigs and fixtures for clamping IC halves
- Metrology support (Y.Cvetkova)

Design completed



Design on-going

Design completed



- **SPbSU** (V.Zherebchevsky et al.) for production of 60 ultralight trusses
- **Mezon Ltd (SPb)** for production of molds for lamination of trusses and end-wheels
- **Euromec, (Modena)** for production of high accuracy jigs for ITS assembling
- **Sergey Igolkin (SPb)** for the design and numerous consultations
-

Thank you for the attention!