

Barrel DIRC Mechanics -Update

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PANDA Collaboration Meeting 19/2

Darmstadt, 2019/06/25

Outline

- Barrel DIRC Main Components
- Conceptual Design of the Radiator Frame
- Potential Usage of Shared Installation Platforms
- Downstream Overlap of GEM/DIRC Border

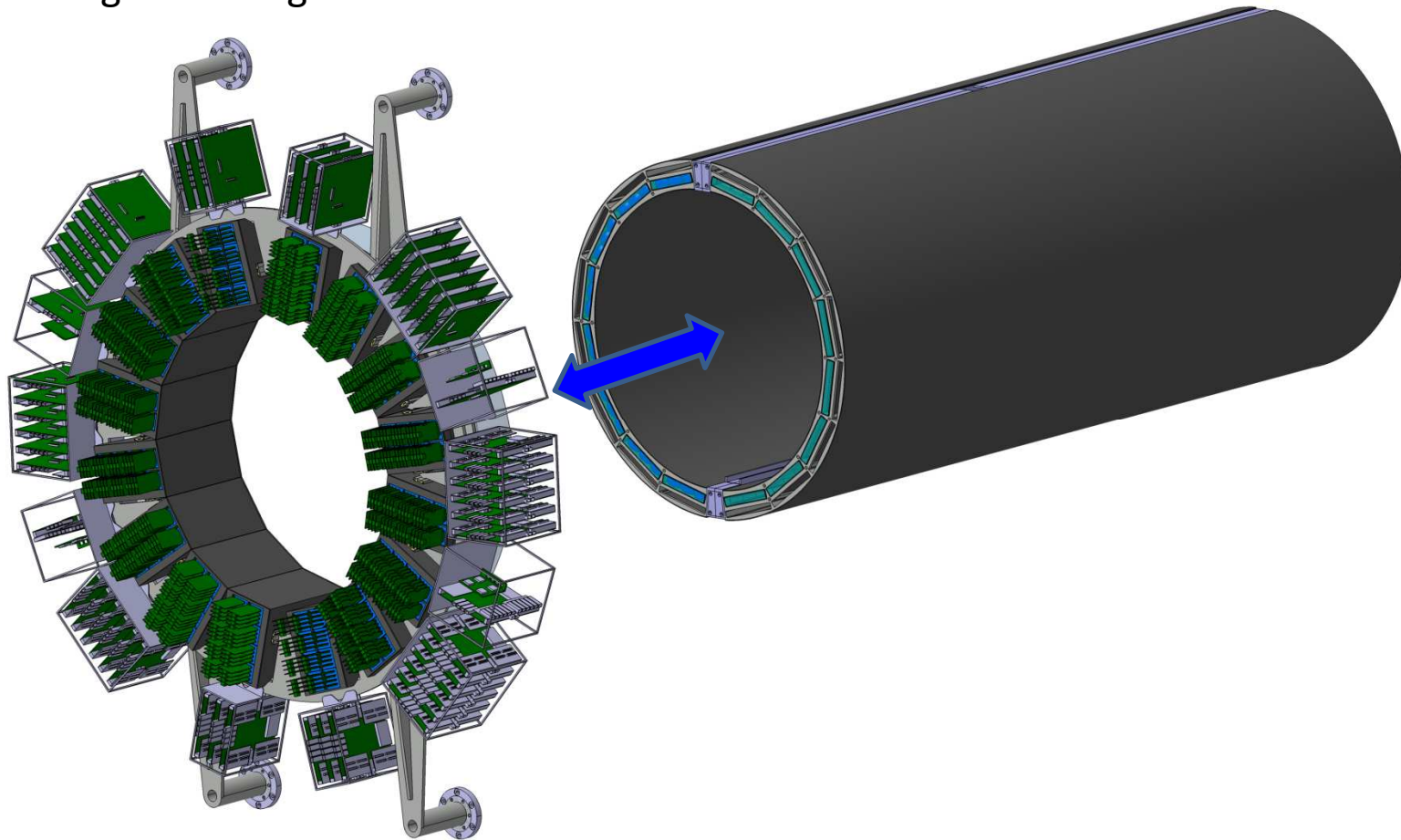
Barrel DIRC Main Components

Readout Unit

- Internal radius 448mm
- External radius 1080mm
- Total weight \approx 500kg

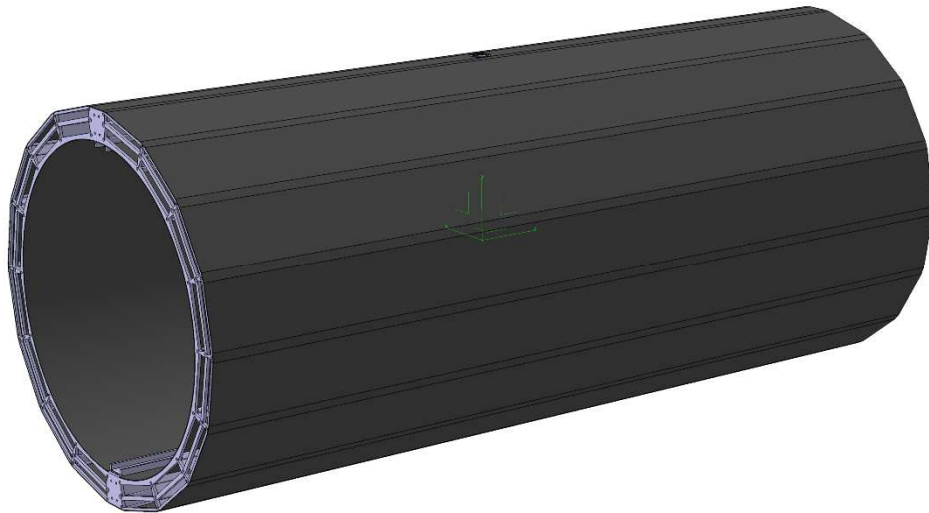
Radiator Barrel (SciTil Support)

- Internal radius 448mm
- External radius 538mm
- Total weight \approx 400kg



Conceptual Design of the Radiator Frame

Support structure of the barrel:

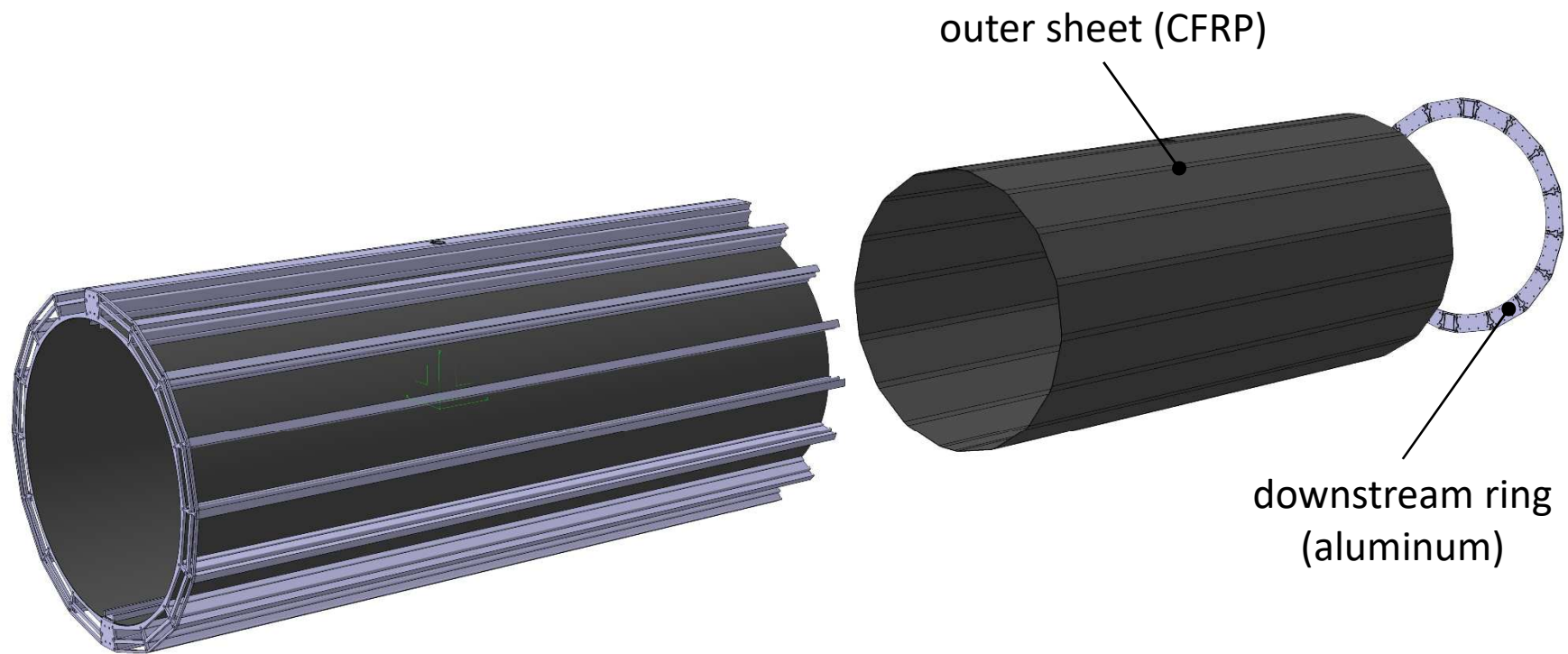


Radiator Barrel Frame:

- Slots for 16 bar boxes
- Slots for 16 SciTil boxes
- Central tracker beams included

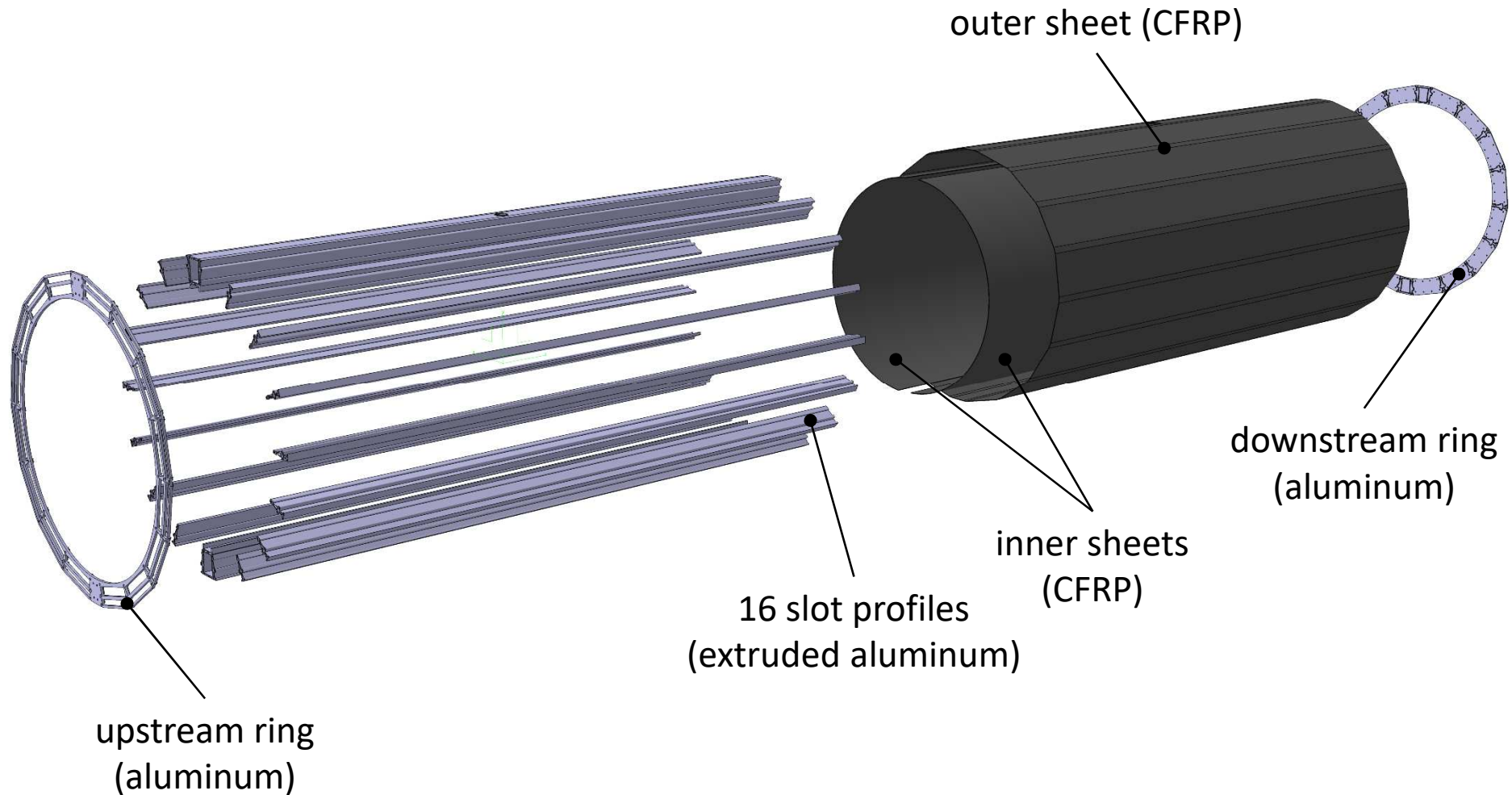
Conceptual Design of the Radiator Frame

Support structure of the barrel:



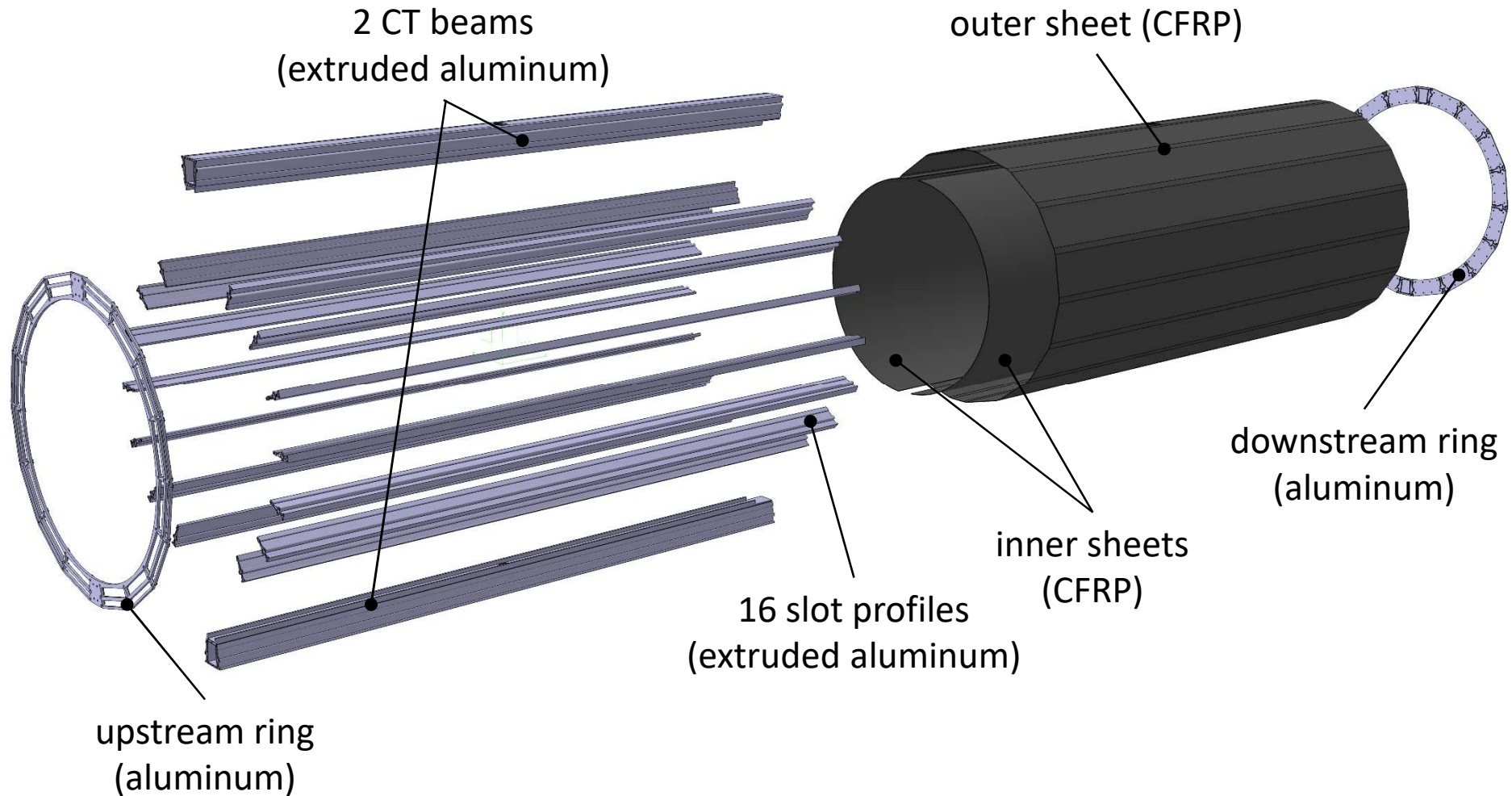
Conceptual Design of the Radiator Frame

Support structure of the barrel:



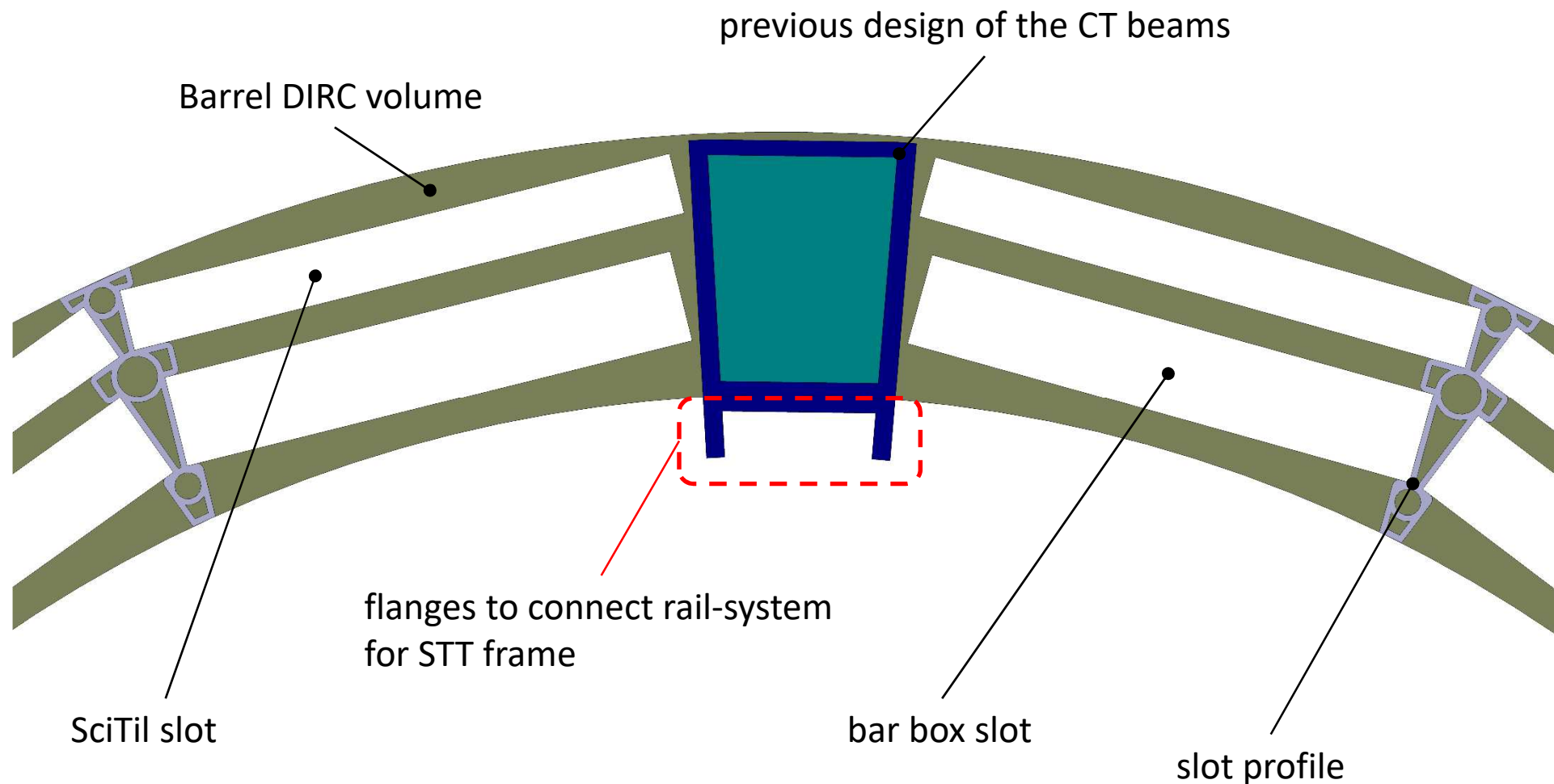
Conceptual Design of the Radiator Frame

Support structure of the barrel:



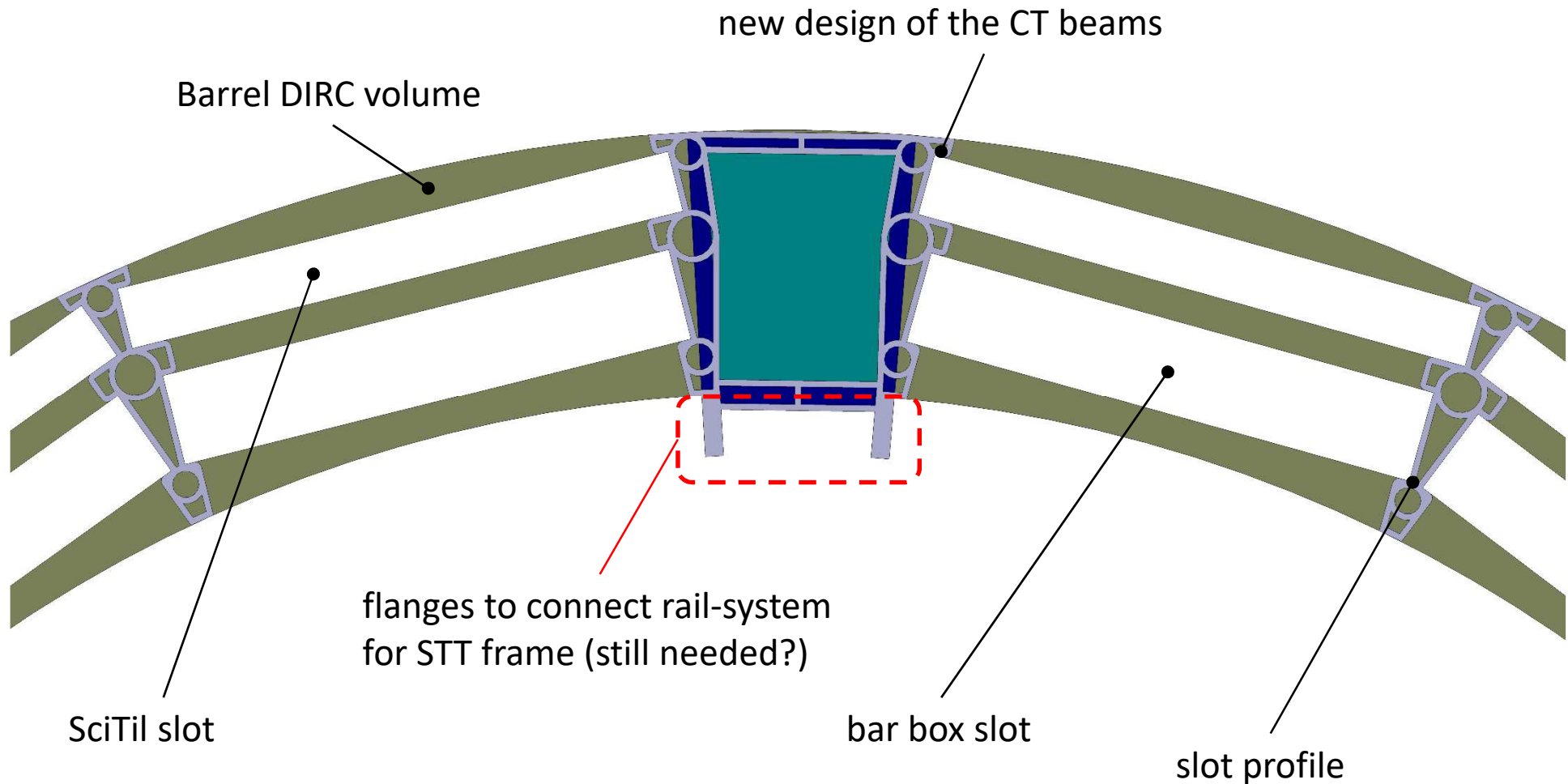
Conceptual Design of the Radiator Frame

CT beams integration:



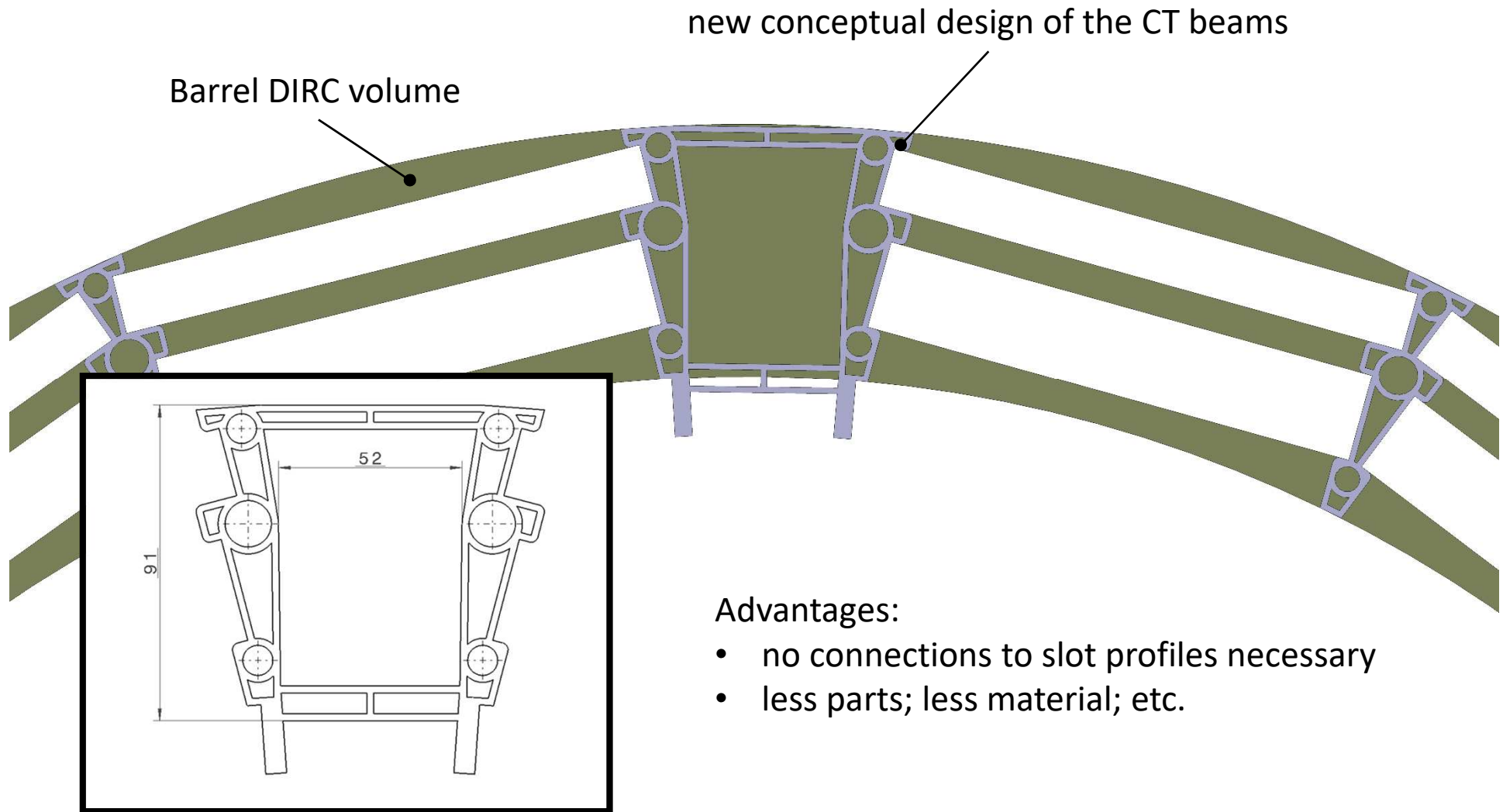
Conceptual Design of the Radiator Frame

CT beams integration:



Conceptual Design of the Radiator Frame

CT beams integration:

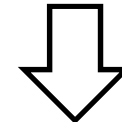
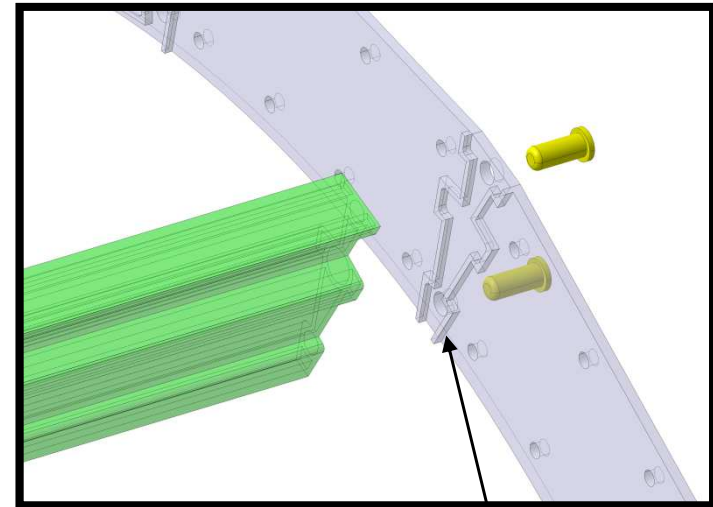
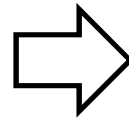
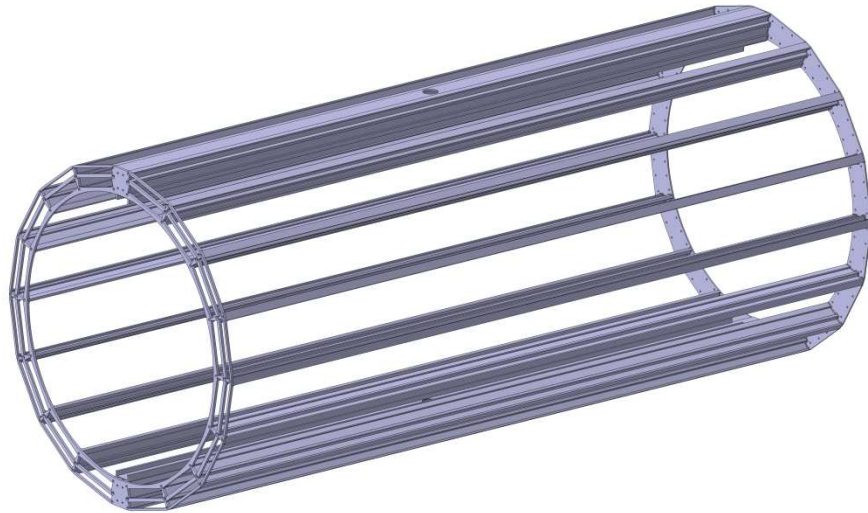


Advantages:

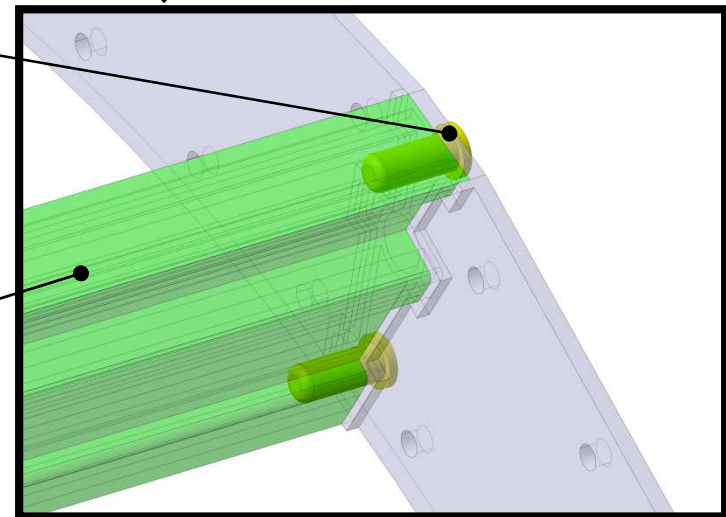
- no connections to slot profiles necessary
- less parts; less material; etc.

Conceptual Design of the Radiator Frame

Connection between rings and profiles (downstream):



machined profile contour



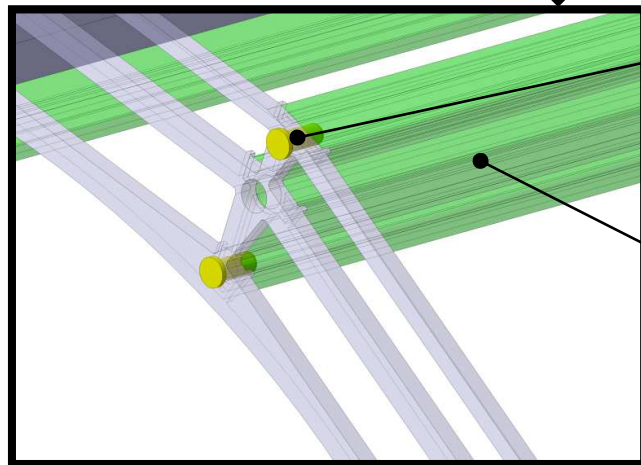
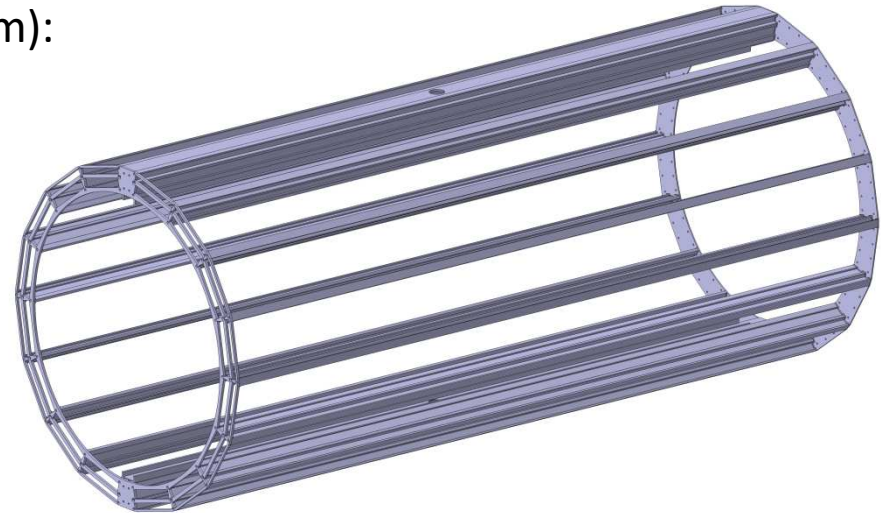
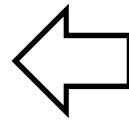
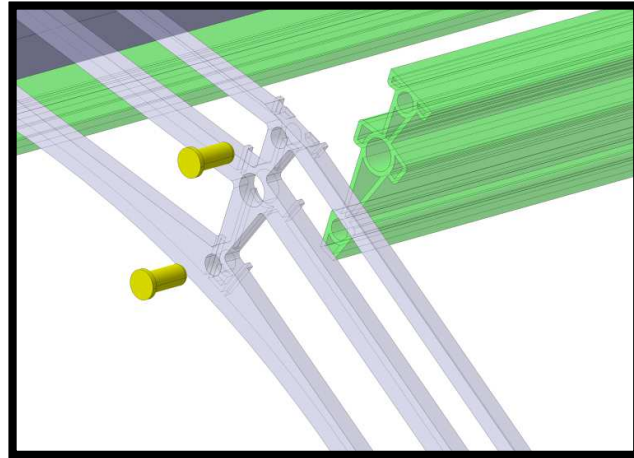
joining bolts

slot profile

- Mechanical joining with bolts to reach a high precision.
- Machined profile contour to reach a defined gap for an adhesive joint.

Conceptual Design of the Radiator Frame

Connection between rings and profiles (upstream):



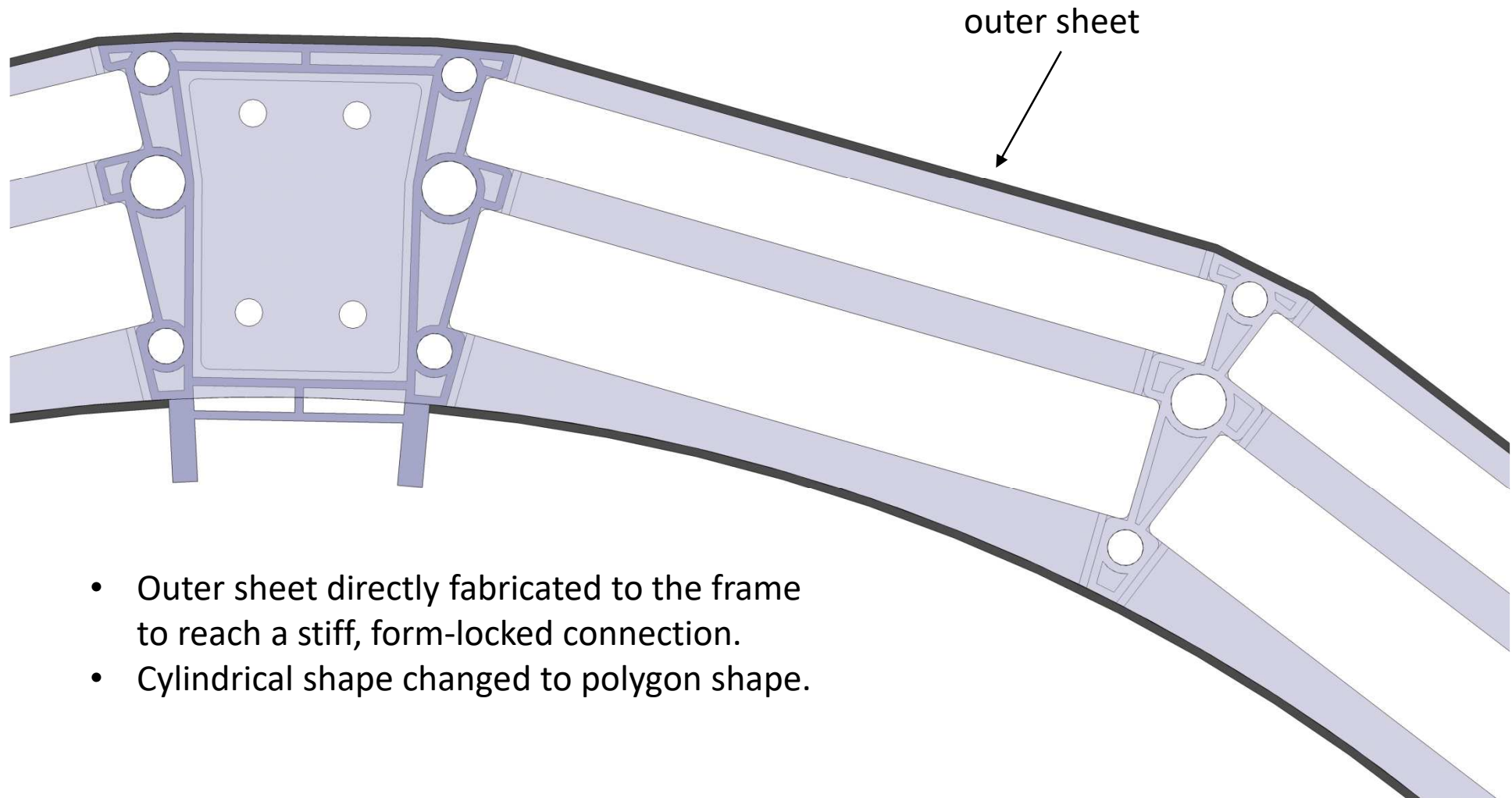
joining bolts

slot profile

- Mechanical joining with bolts to reach a high precision.
- Machined profile contour to reach a defined gap for an adhesive joint.

Conceptual Design of the Radiator Frame

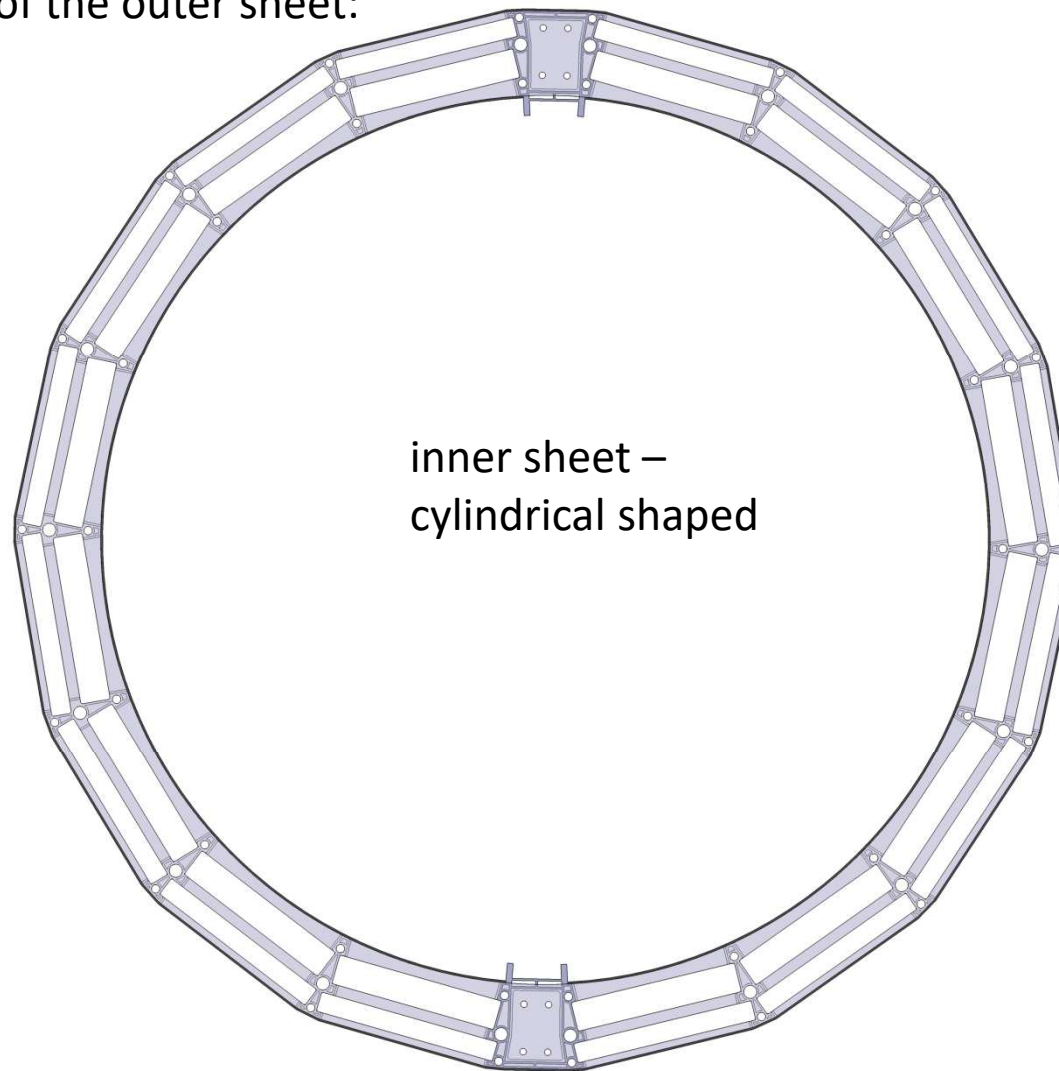
Conceptual Design of the outer sheet:



- Outer sheet directly fabricated to the frame to reach a stiff, form-locked connection.
- Cylindrical shape changed to polygon shape.

Conceptual Design of the Radiator Frame

Conceptual design of the outer sheet:

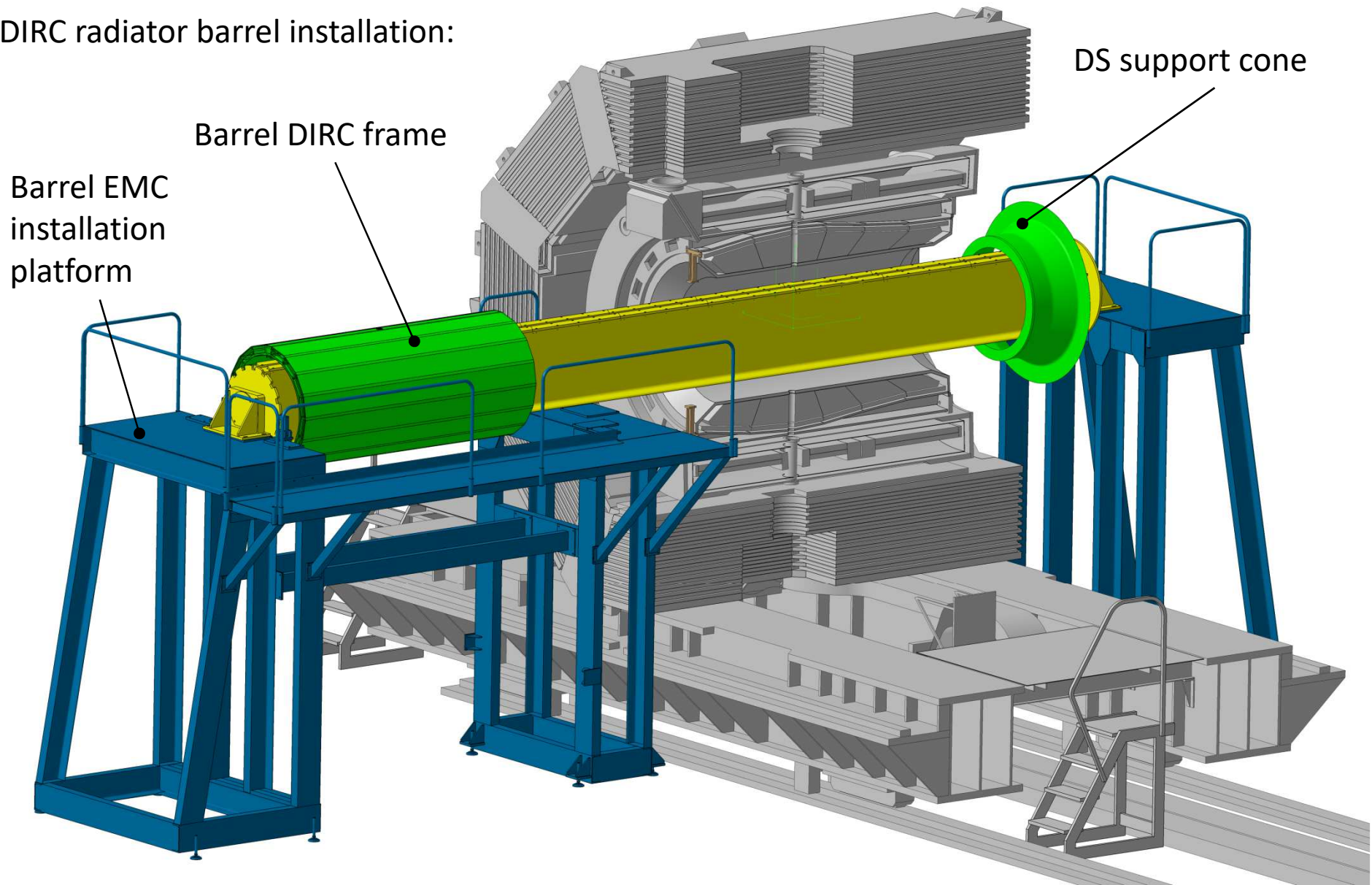


outer sheet –
polygonal shaped

inner sheet –
cylindrical shaped

Potential Usage of Shared Installation Platforms

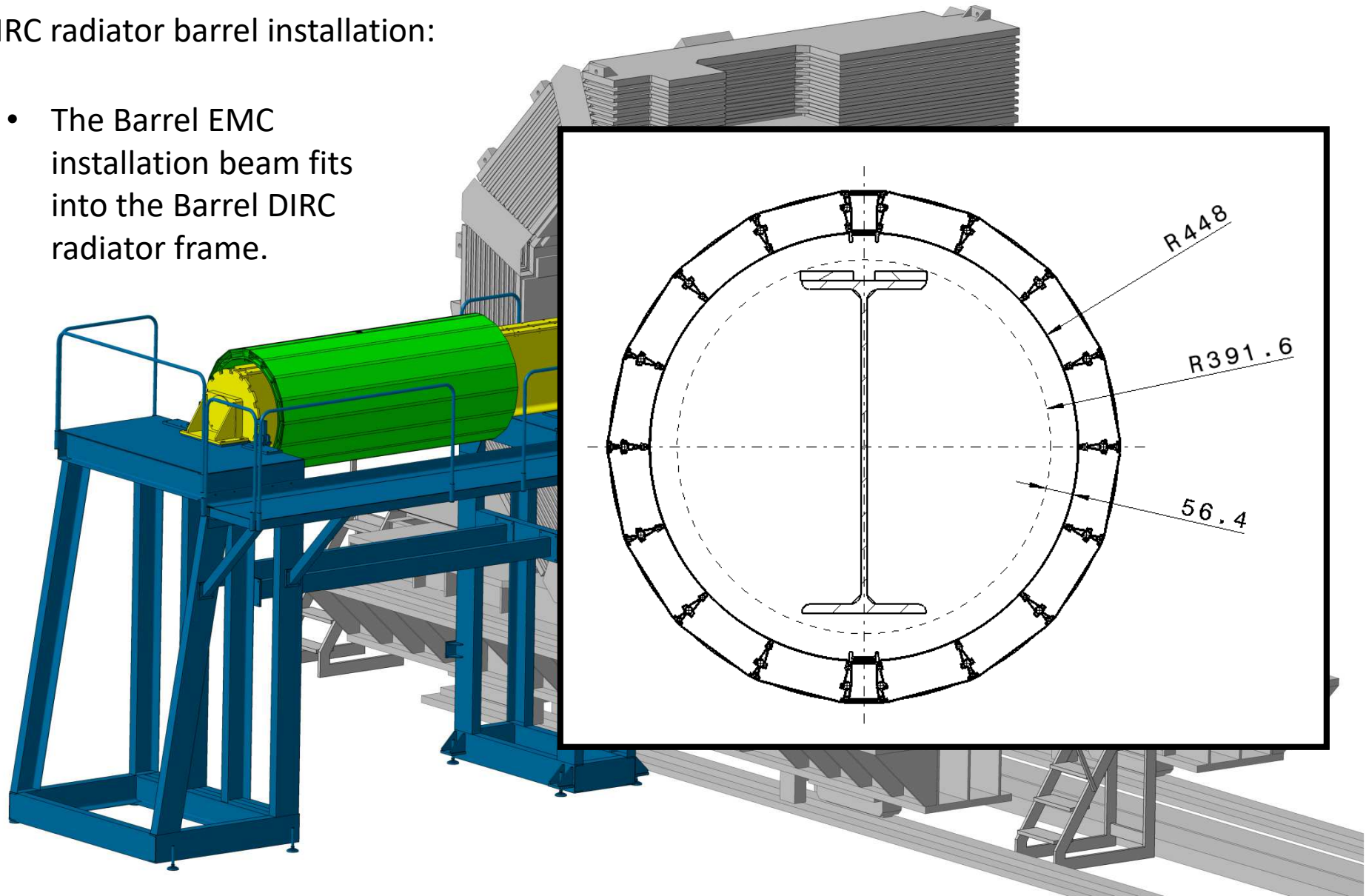
DIRC radiator barrel installation:



Potential Usage of Shared Installation Platforms

DIRC radiator barrel installation:

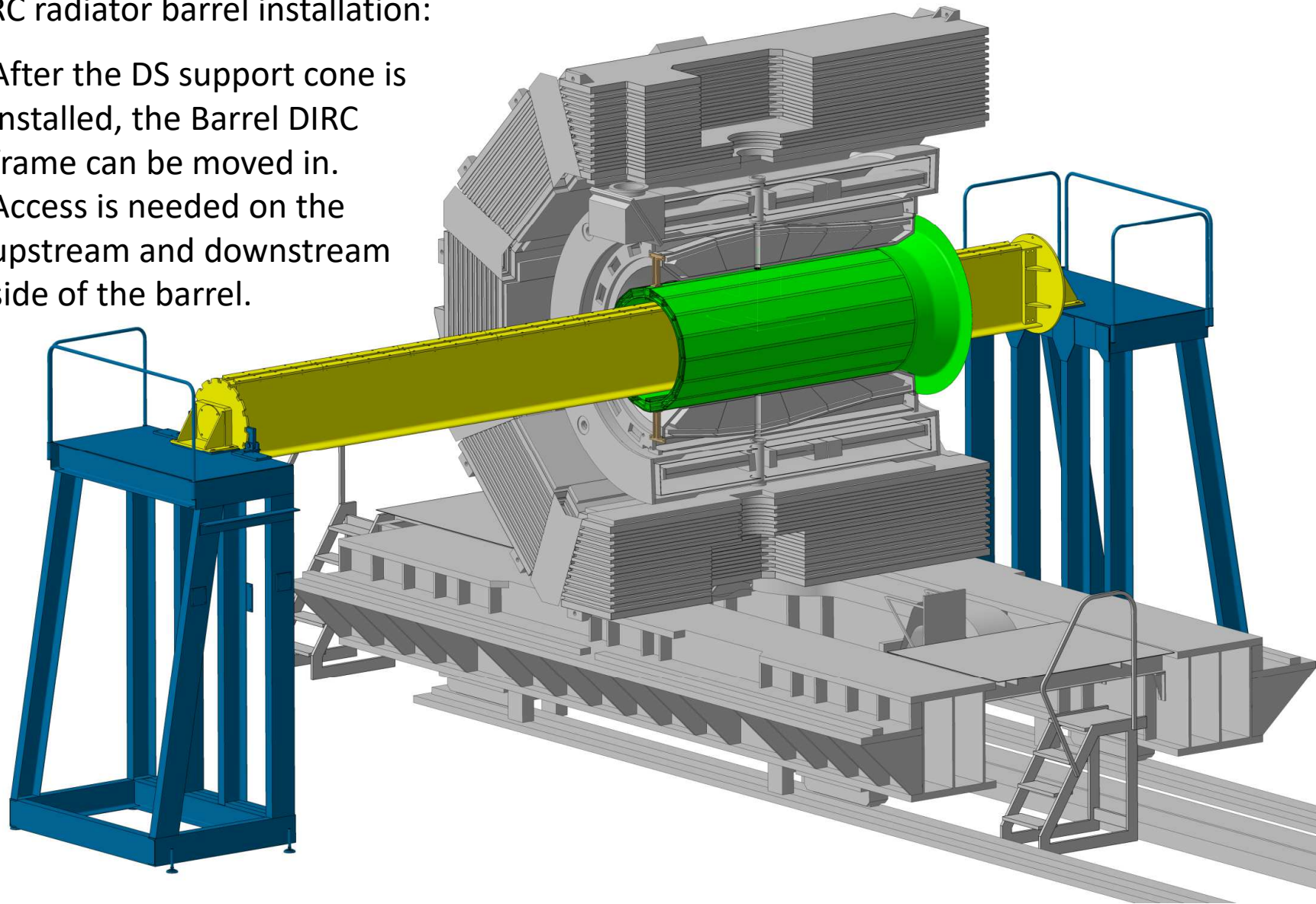
- The Barrel EMC installation beam fits into the Barrel DIRC radiator frame.



Potential Usage of Shared Installation Platforms

DIRC radiator barrel installation:

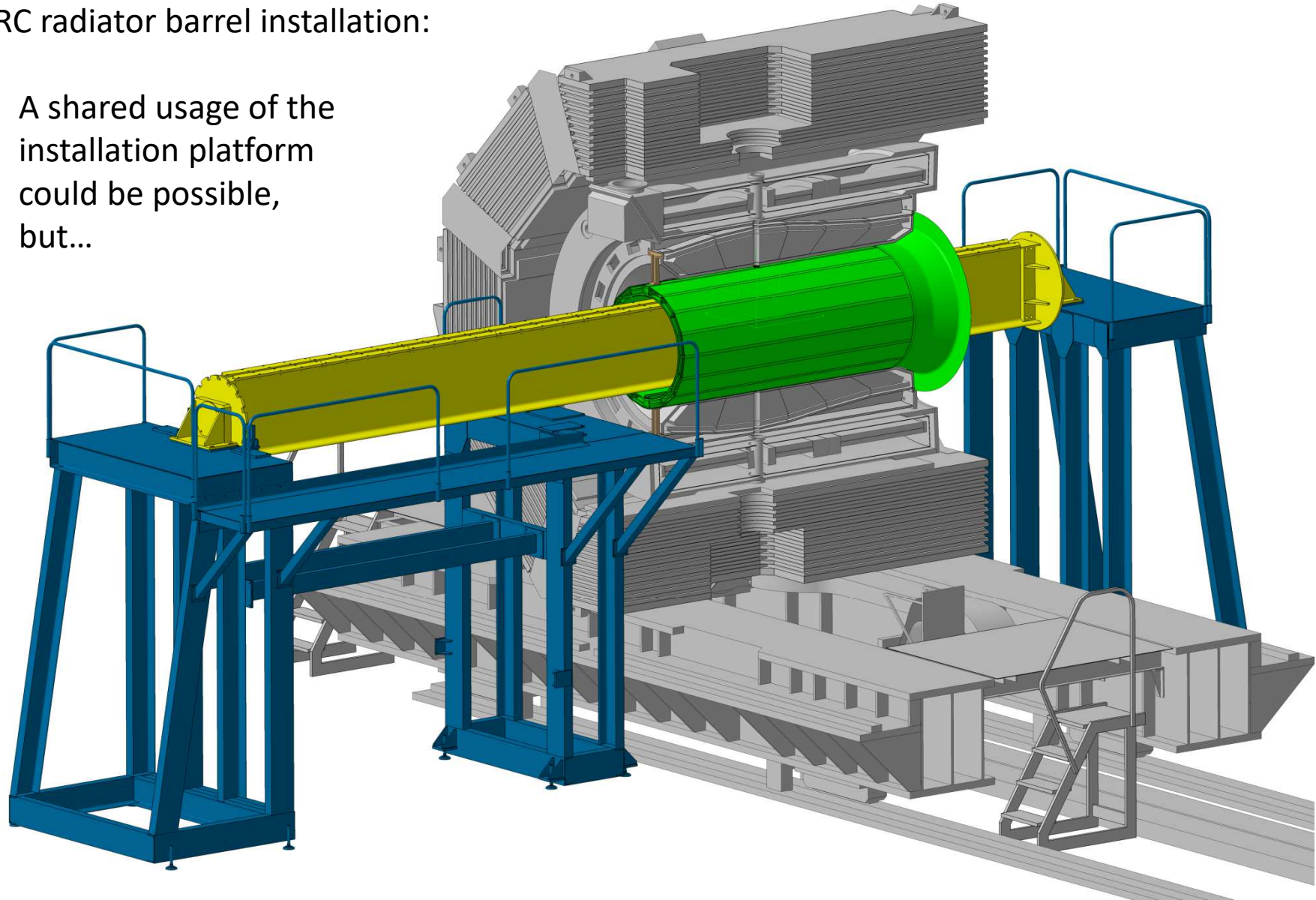
- After the DS support cone is installed, the Barrel DIRC frame can be moved in. Access is needed on the upstream and downstream side of the barrel.



Potential Usage of Shared Installation Platforms

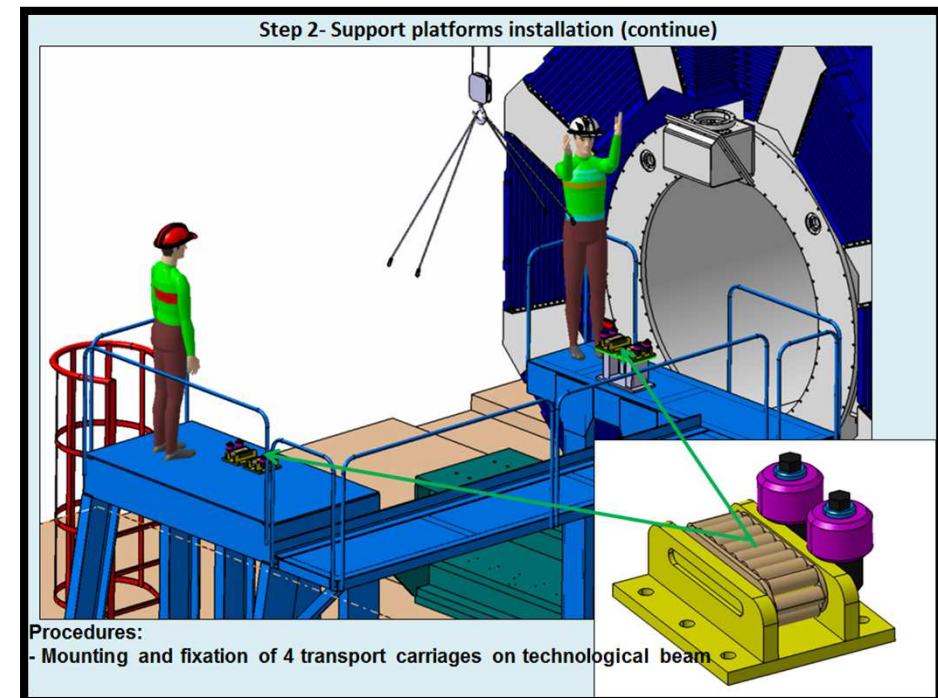
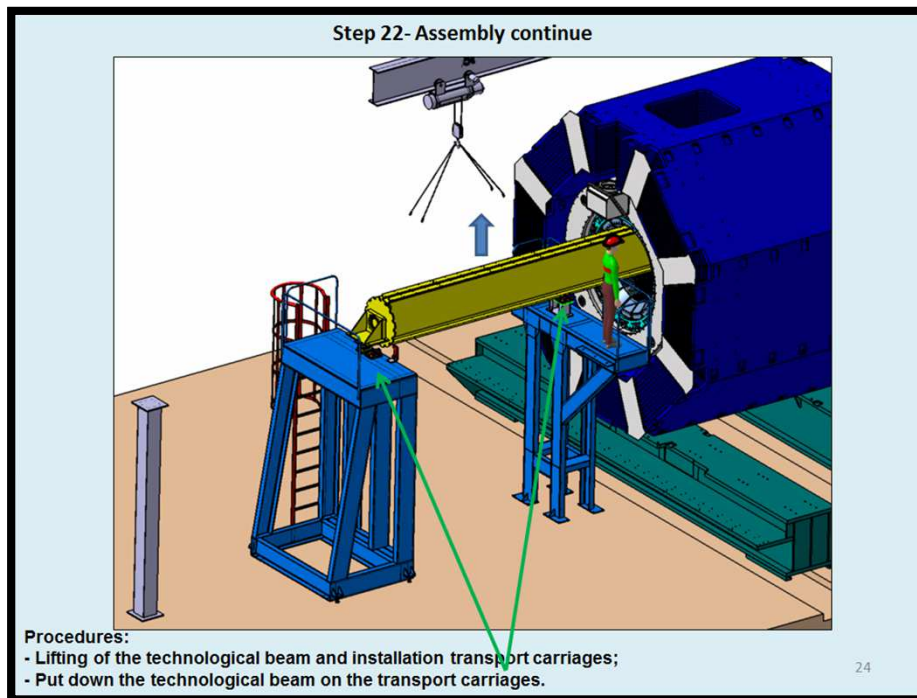
DIRC radiator barrel installation:

- A shared usage of the installation platform could be possible, but...



Potential Usage of Shared Installation Platforms

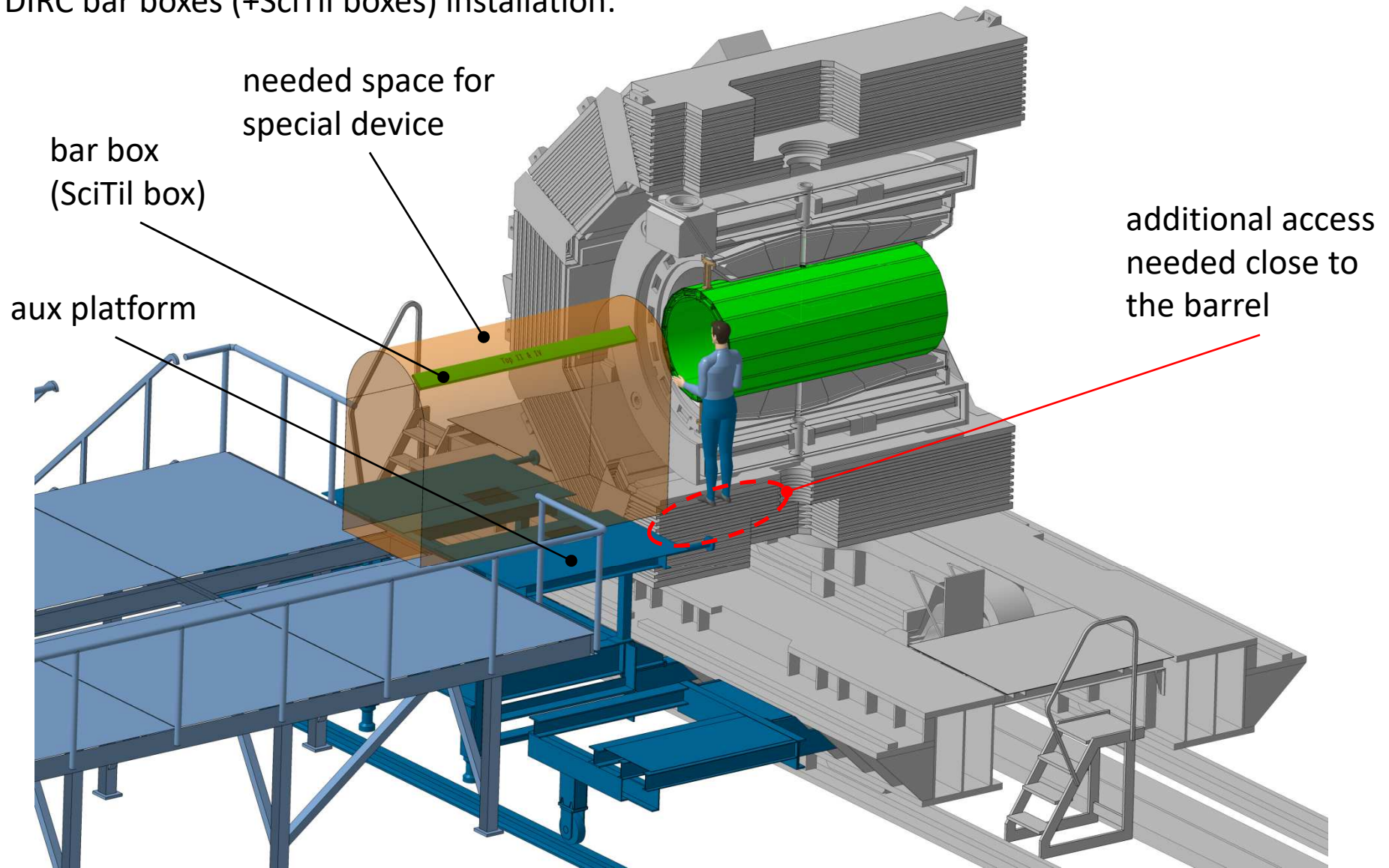
- ... the preliminary concept intends to lift the installation beam to move it out of the barrel. This could be a problem with the dimensions of the Barrel DIRC.



Slides from talk of Valeriy Ferapontov – February 2019

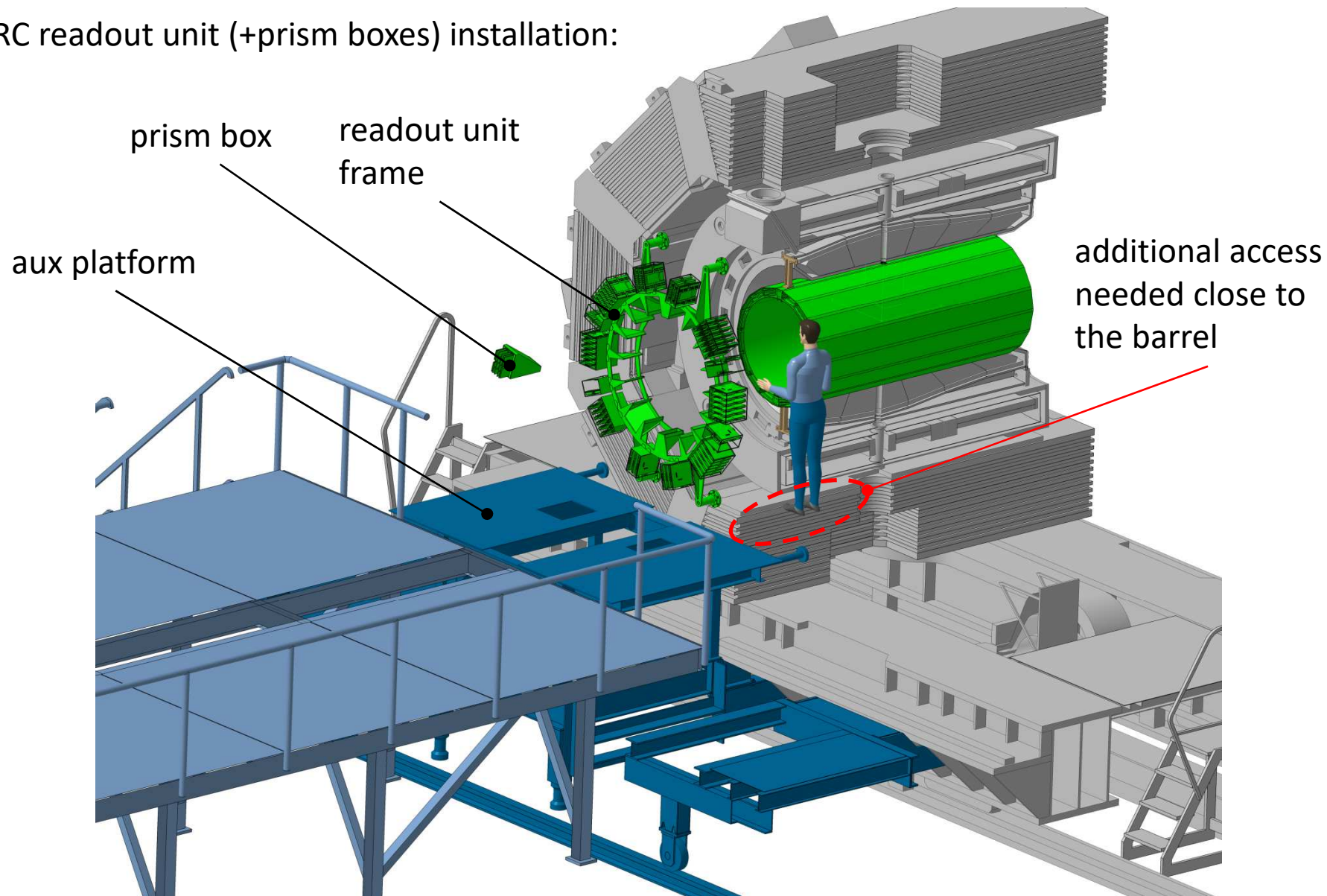
Potential Usage of Shared Installation Platforms

DIRC bar boxes (+SciTil boxes) installation:

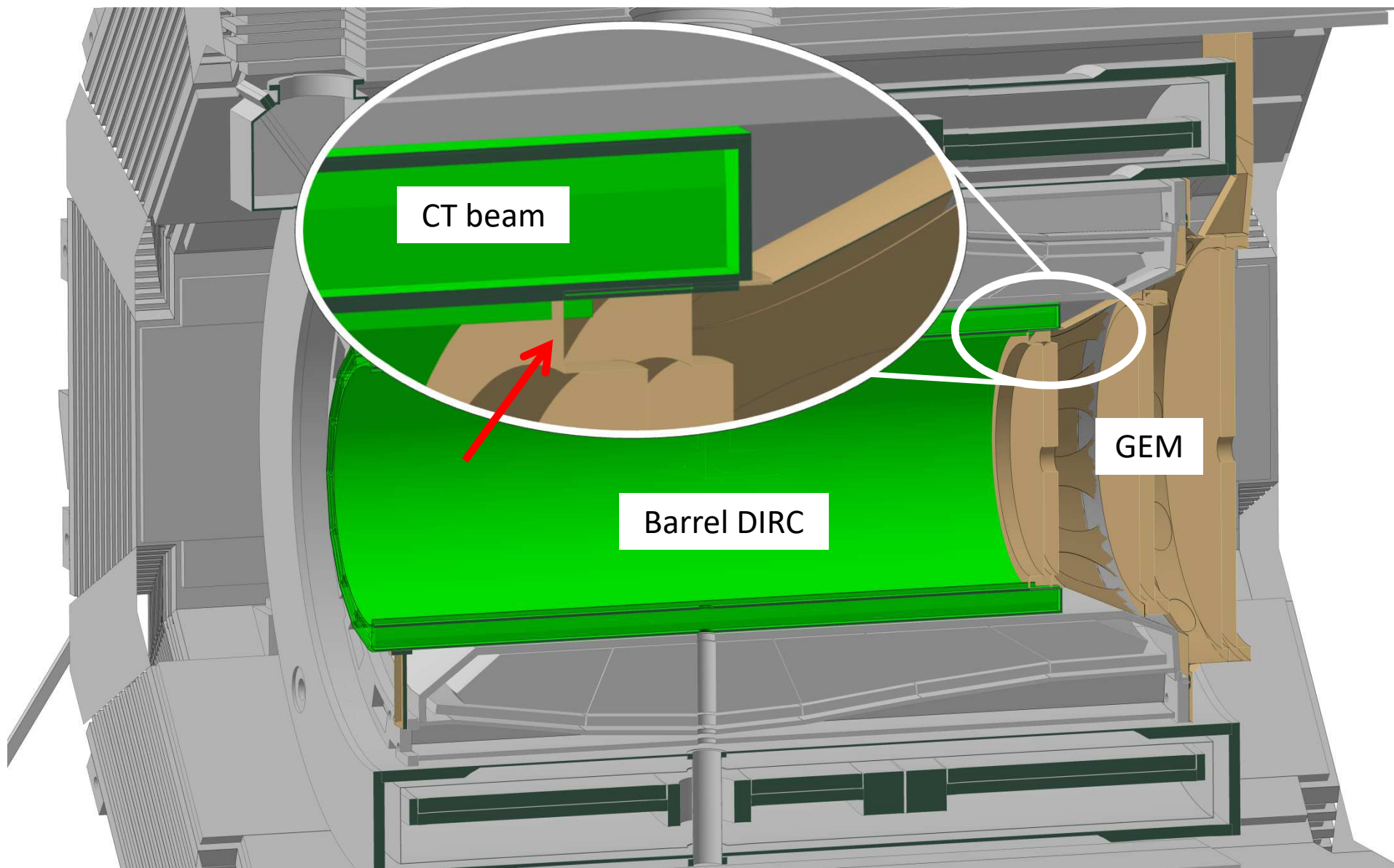


Potential Usage of Shared Installation Platforms

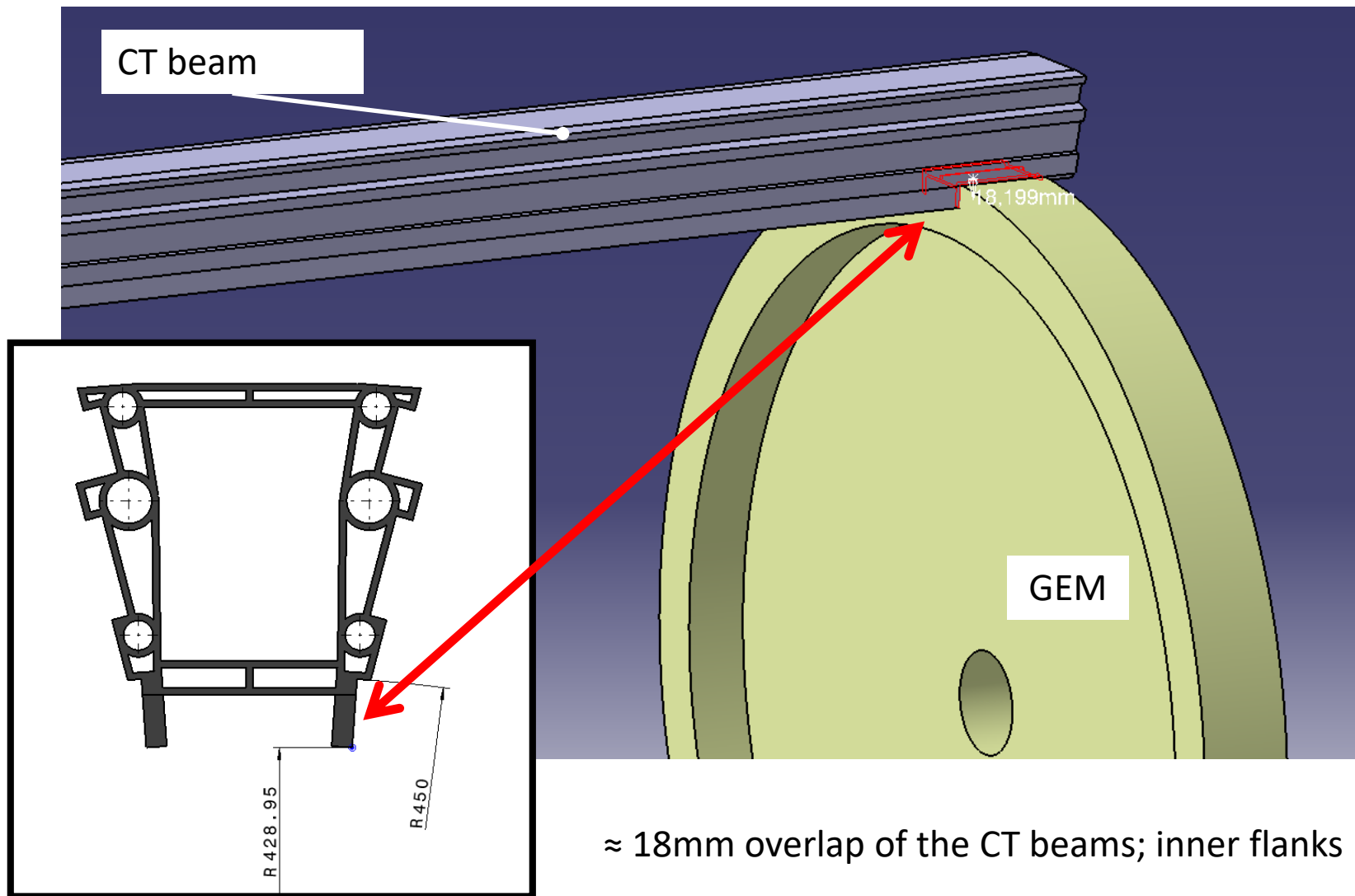
DIRC readout unit (+prism boxes) installation:



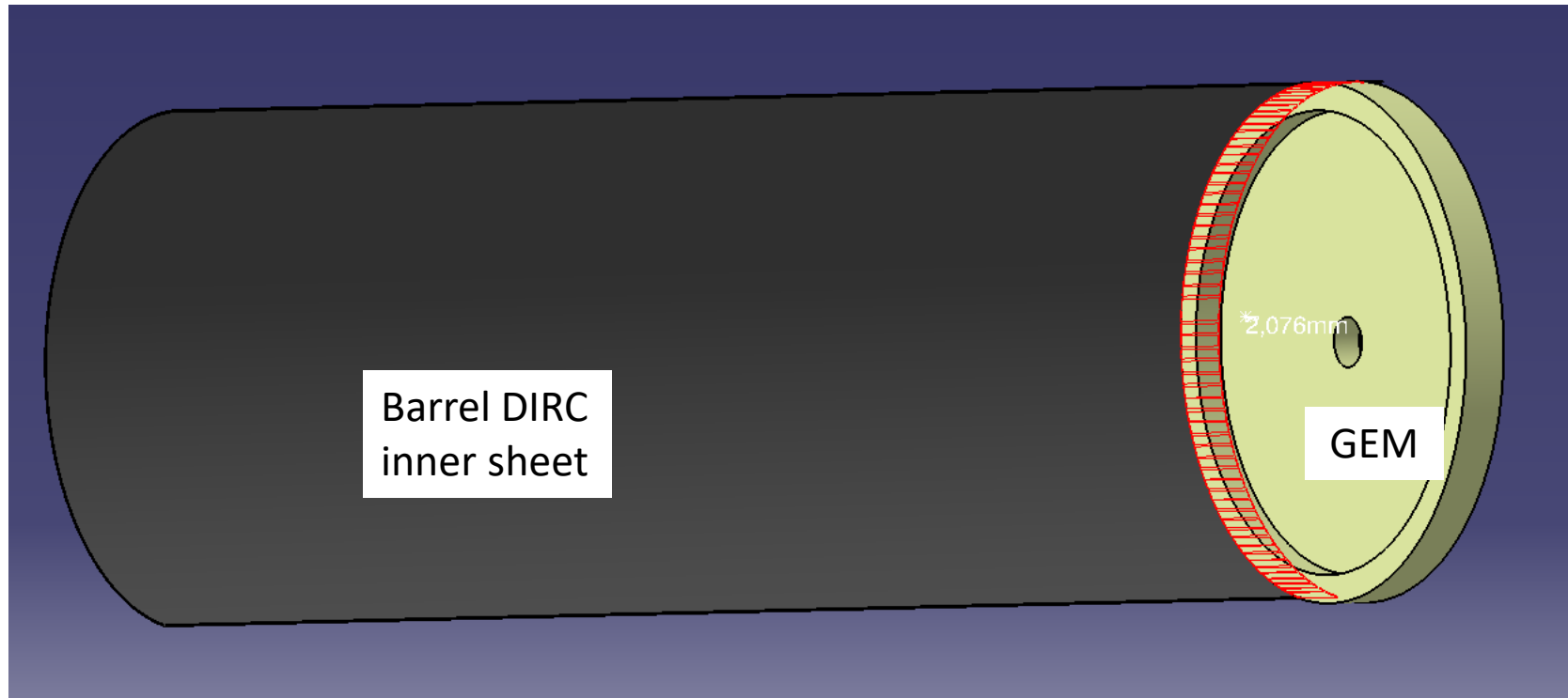
Downstream Overlap of GEM/DIRC Border



Downstream Overlap of GEM/DIRC Border



Downstream Overlap of GEM/DIRC Border



- $\approx 2\text{mm}$ overlap of the GEM and the Barrel DIRC inner sheet
- a lot of 0-contacts between GEM and Barrel DIRC surfaces (need to check the safety distances)

Involved groups are in contact and working on a solution...

Thank you for your attention.