

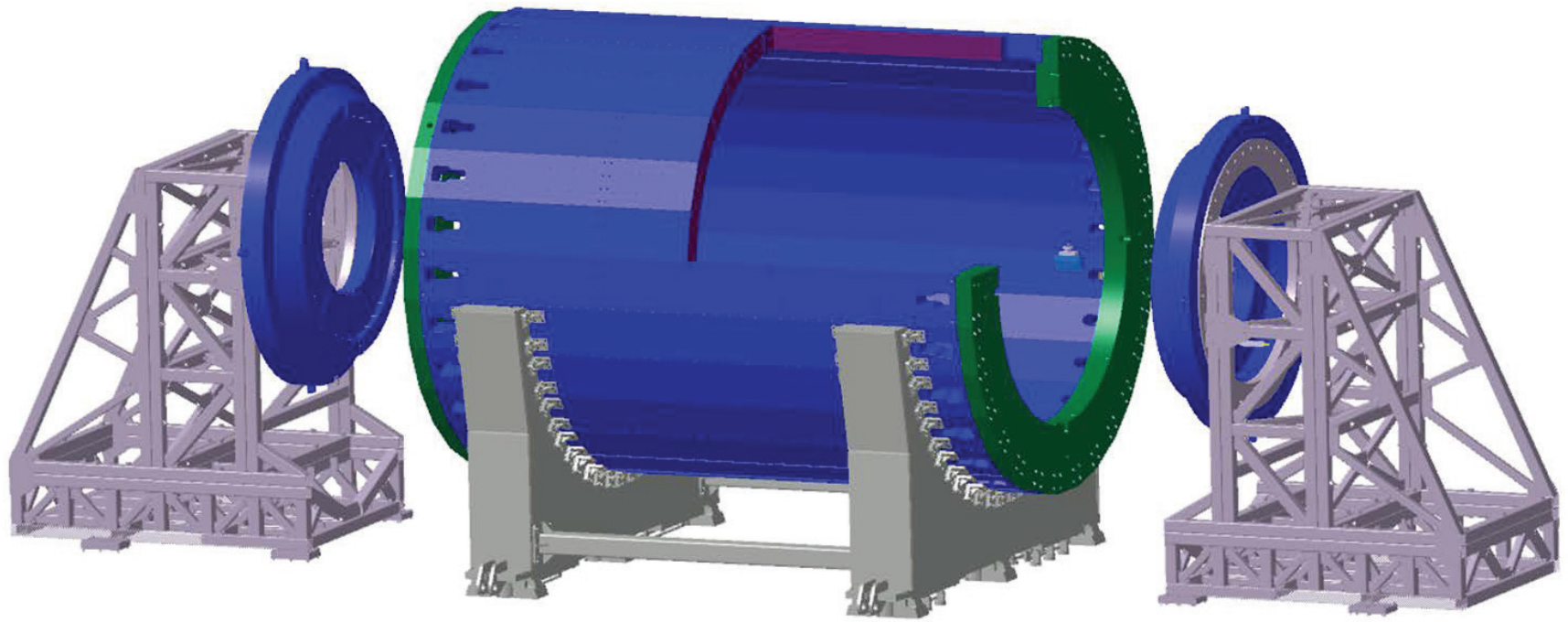
MPD Yoke assembly

September 2021

N.Topilin, E.Belyaeva, E.Gerasimov

JINR, Dubna

MPD Yoke (L=8970 mm, Ø6625 mm)



28 plates

16 t each

2 support rings

42.5 t each

2 poles

44 t each

Total: 621 t

Material:
Steel 10 (AISI 1010)
forging

Lodgement (Yoke support) – 70 tons,
ordinary steel St.3 (Fe 360)

Pole transport supports 15 tons each
without ballast

MPD yoke preassembly at VHM, June-August 2018



MPD pre assembly at JINR

(13 July – 12 August 2020)

Leading engineer N.Topilin VBLHEP

1-st stand

JINR-Pelcom plant team

1-st plate: 8.5 m length, 16 tons

42 t Pole installation

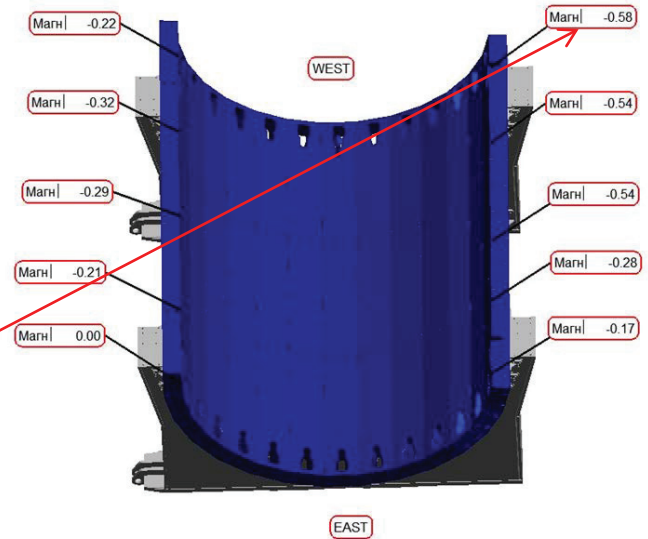
13 plates and 2 rings as 1 piece
370 tons in total

Support ring lifting, $\varnothing$ 6.7 m, 44 tons

JINR-Pelcom plant team

Measurements by “Industrial Measurements” LLC (ООО “Промышленные измерения”) , S.Peterburg

- Rails planarity (top and side surfaces) – 0.4 mm on length 30 m
- 12 stands height deviations – 0.1 mm max
- Stands shape deviation – 0.2 mm max
- 7 plates in assembly – nonplanarity 0.5 mm
- 13 plates in assembly - nonplanarity 0.58 mm max



The highest point is taken as zero. All values in mm.

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13-th plate
installation

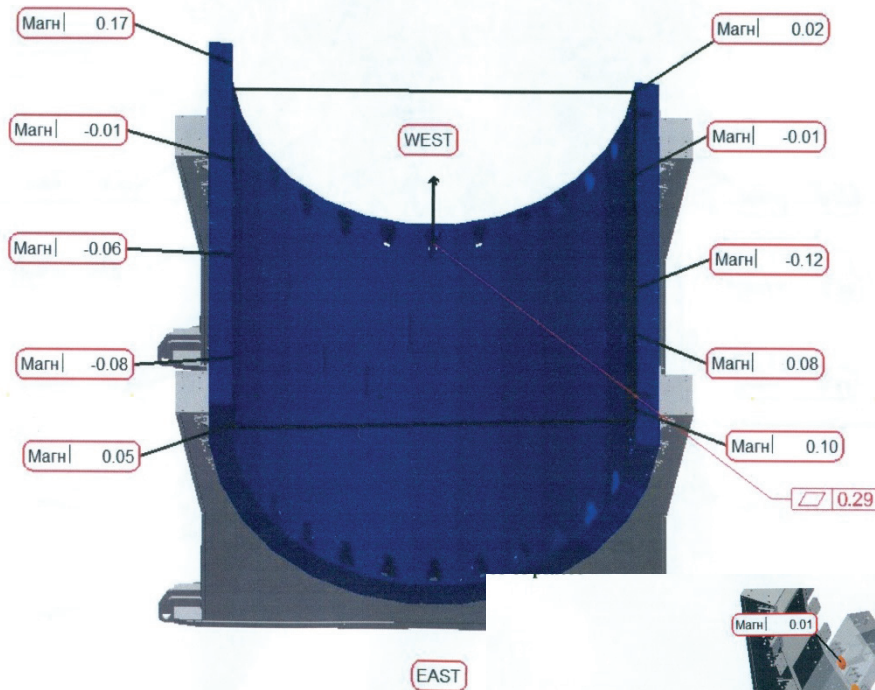


07.10.2021

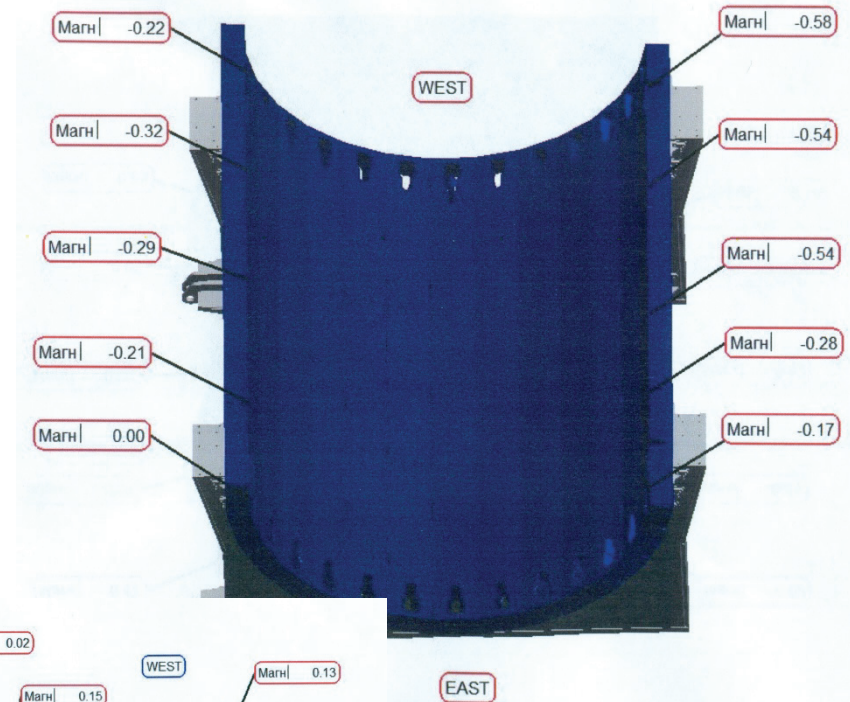
RuPAC-2021, N.Topilin

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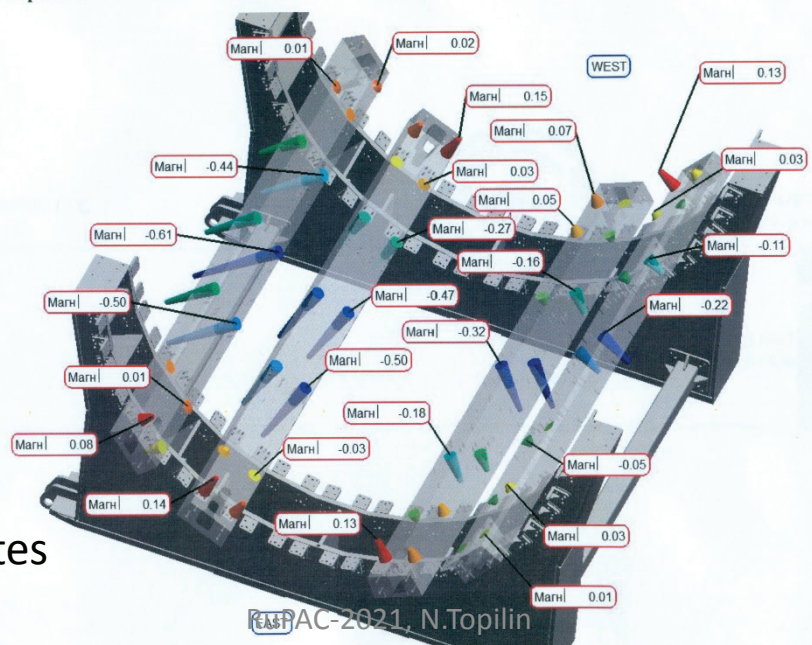
Geometry of 13 plates in the assembly



Nonflatness of plates
12-13 per faces



Nonflatness of plates
12-13 per faces
relative to the
horizontal plane



Nonflatness of plates
##4-5 and ##8-9

07.10.2021

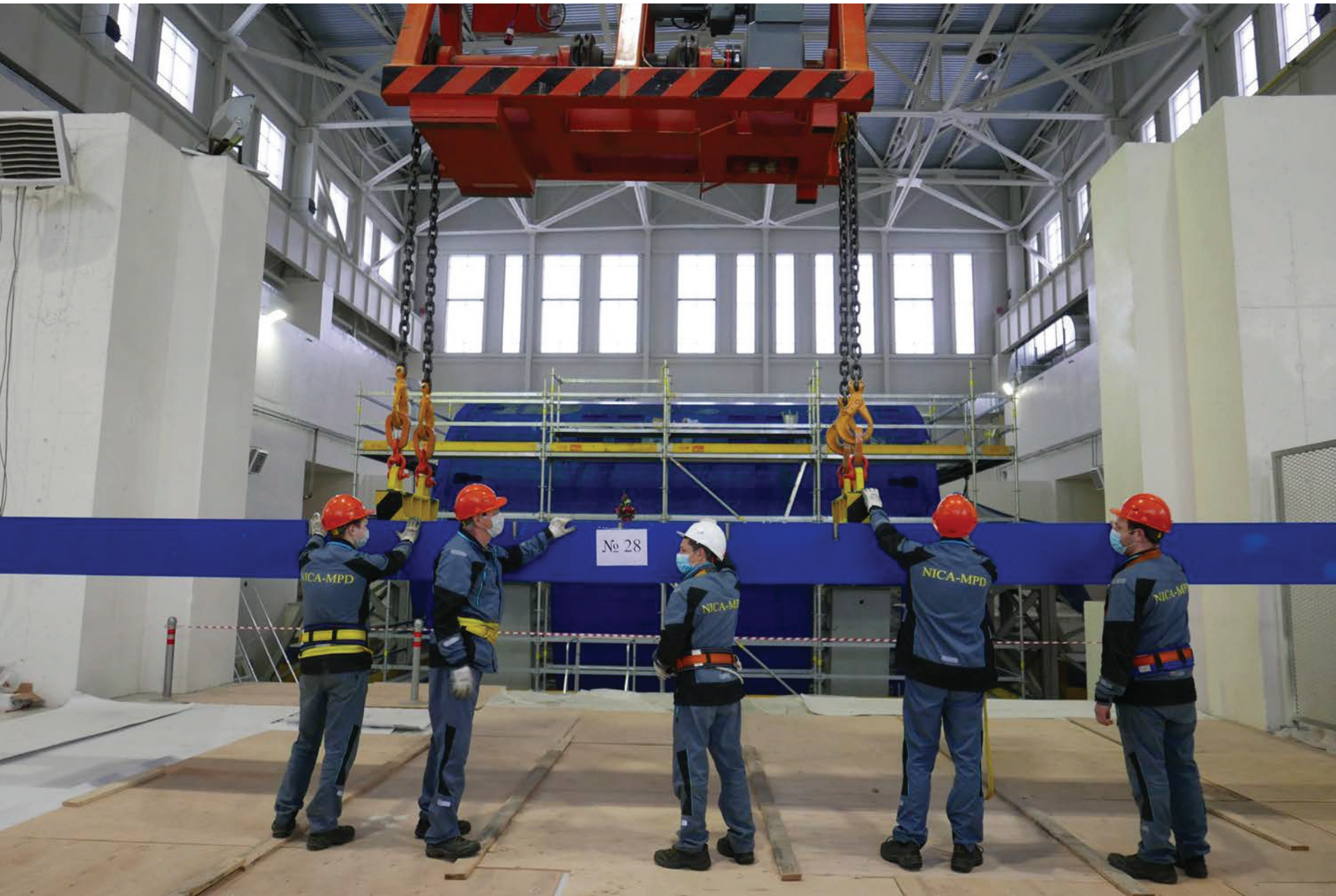
ИПAC-2021, N.Topilin

All values in mm.

Capturing the position of the plate with micron accuracy
Поимка положения плиты с микронной точностью



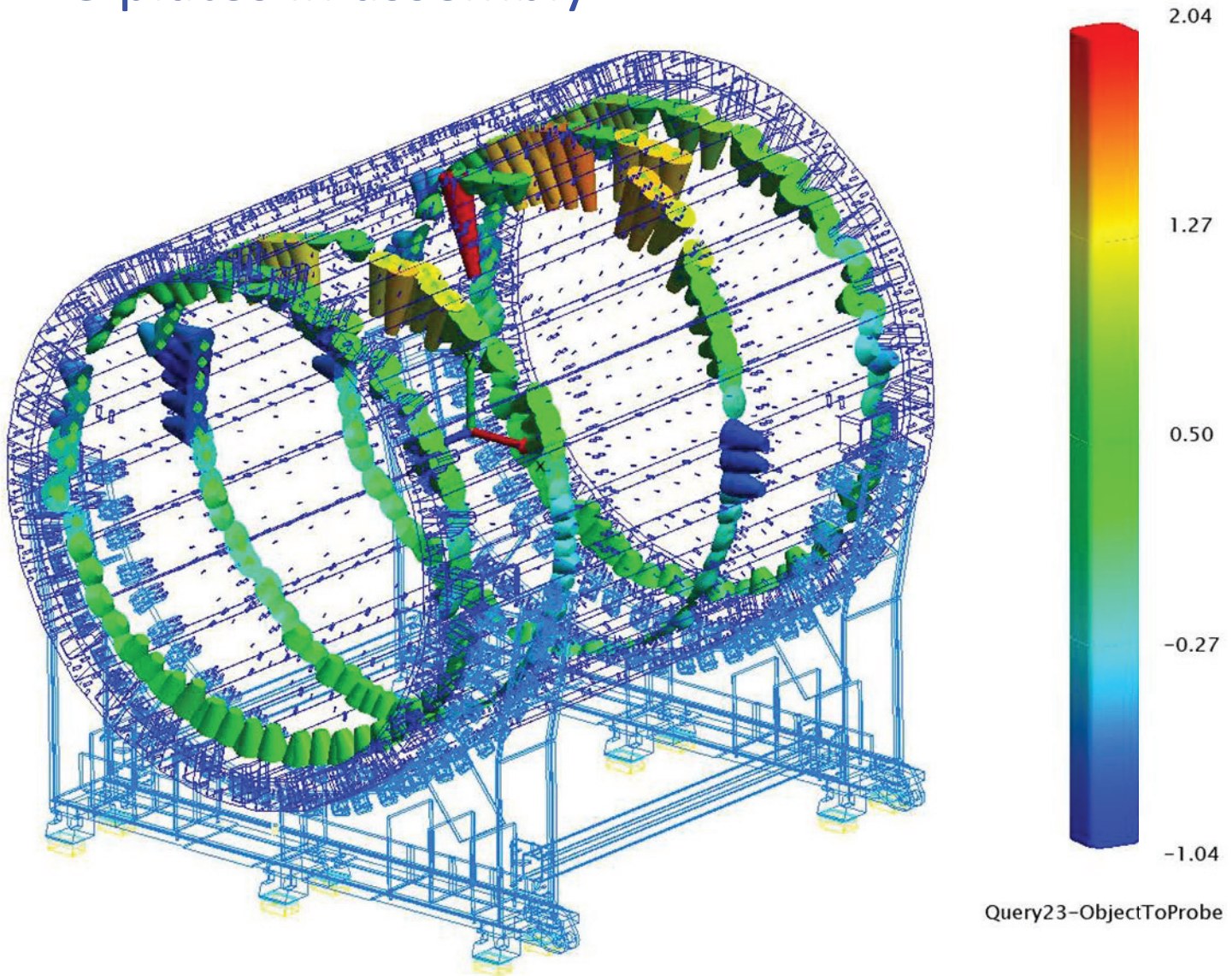
Installation top (last) plate #28



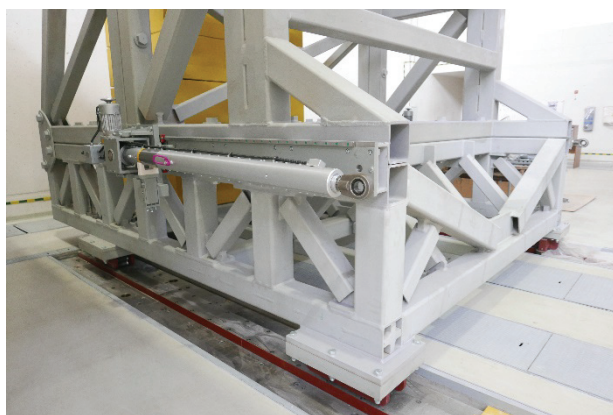
December 25, 2020



28 plates in assembly



Poles installation





Poles positions in the Yoke

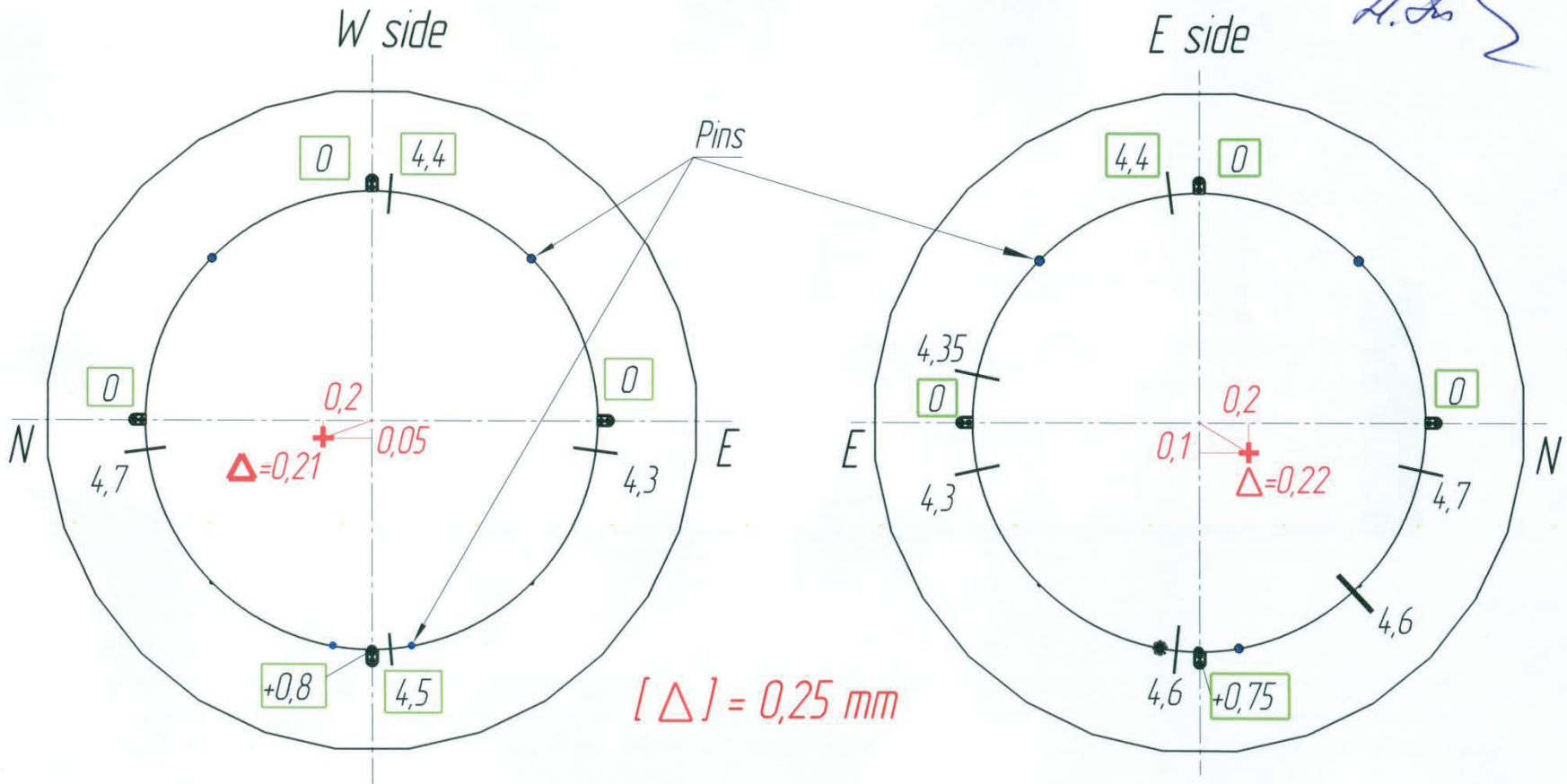
07 April 2021

N. Topilin

H. As

Gaps in mm

($\varnothing 0,5$ mm in the drawing)



- - Not flatness (steps between Pole and Support ring);
- that requirements do not indicated in the drawings.

Pole positions inside requirements !

Movement system assembly and test



07.10.2021

RuPAC-2021, N.Topilin

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The movement system allows you to move an object weighing up to 1000 tons with a positioning accuracy of 0.1 mm across the beam and install it with an accuracy of 0.1 mm in height.

The accuracy of the installation of the pole axis relative to the axis of the support ring is 0.25 mm (provided technologically).

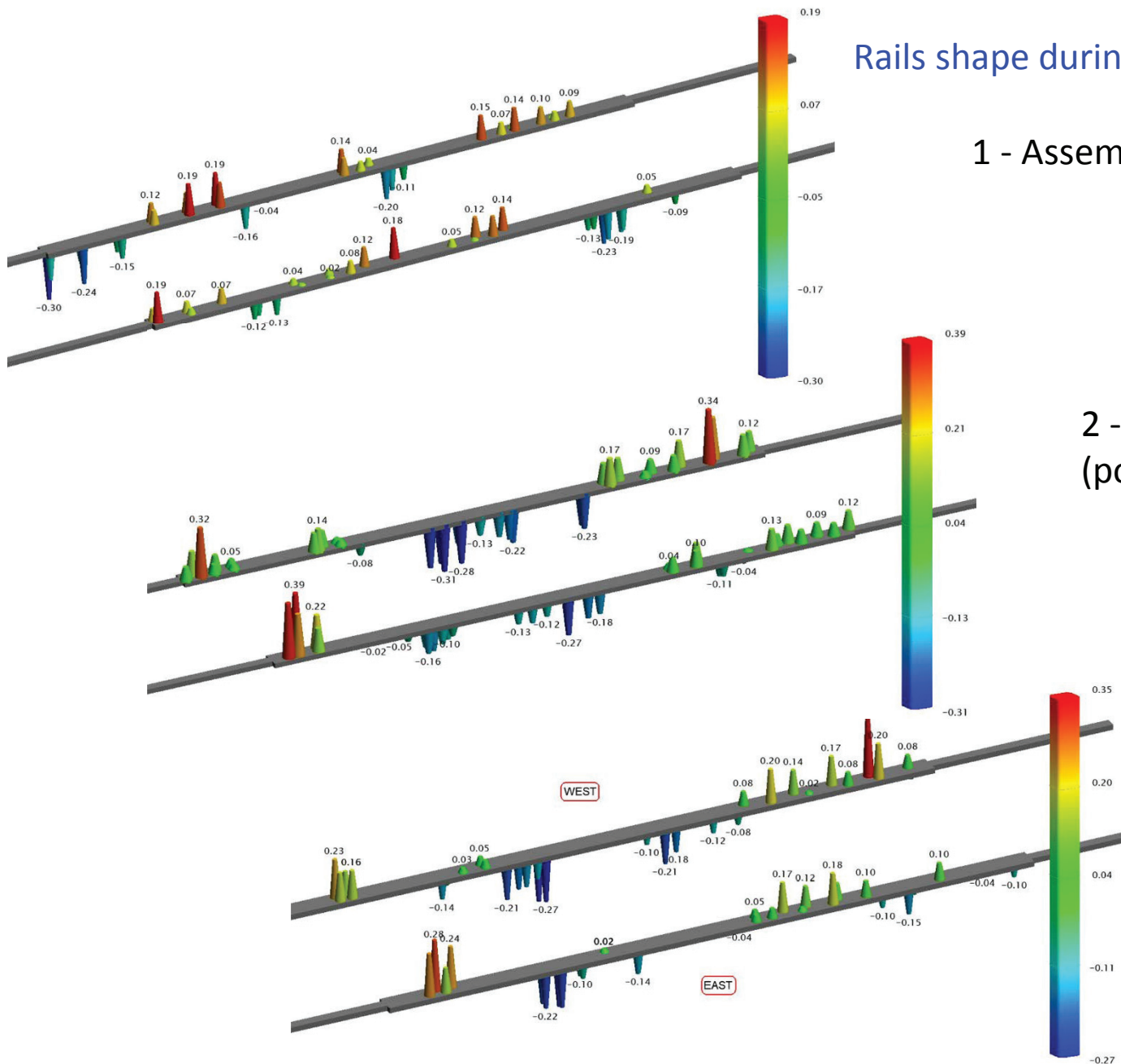
The speed of movement of all rods is from 0 to 3 mm/s.

Rails shape during Yoke moving

1 - Assembly zone position

2 - Central position (poles installation)

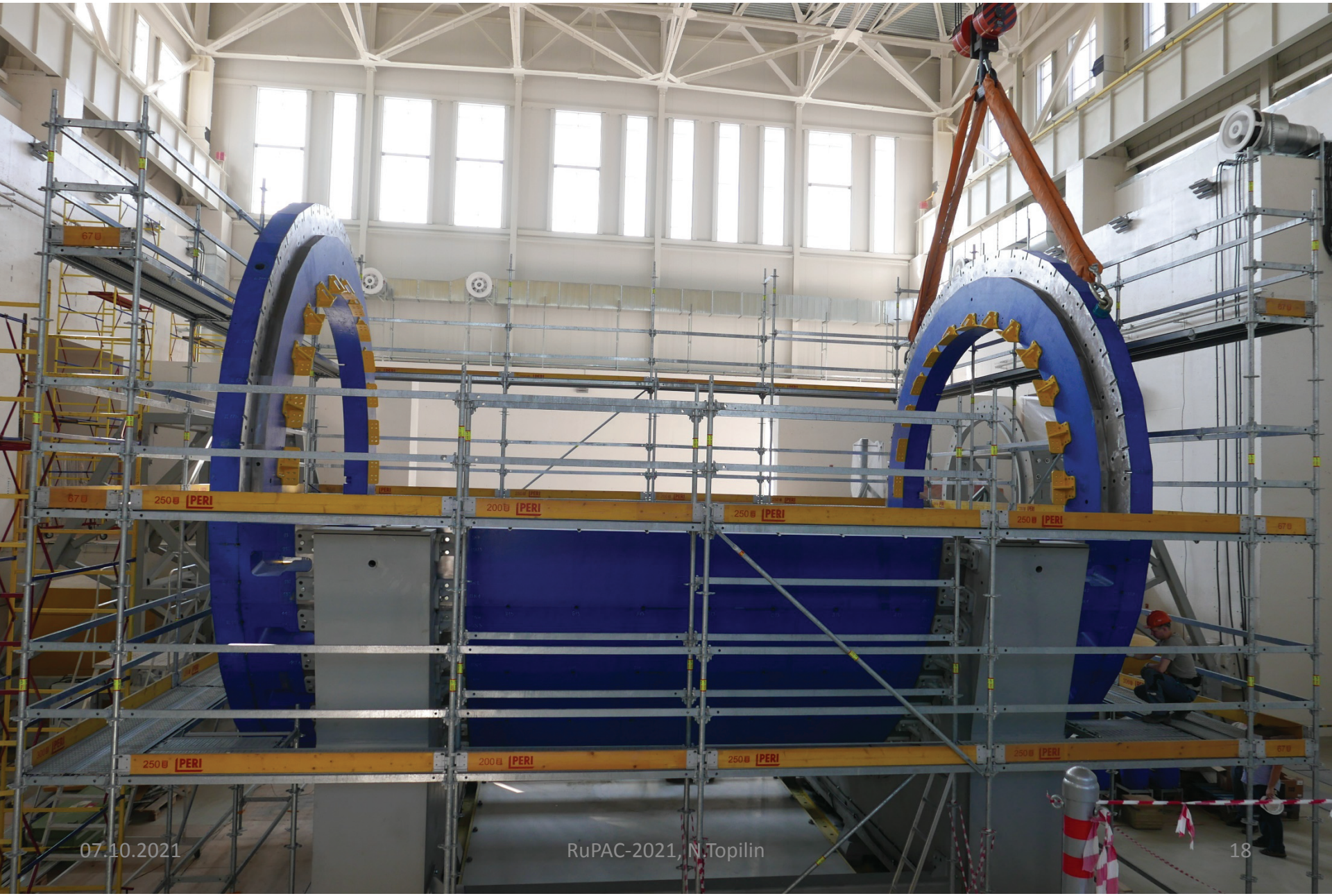
3 - Beam position



Power frame brackets



July 16, 2021



07.10.2021

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Technology beam 8470 mm length



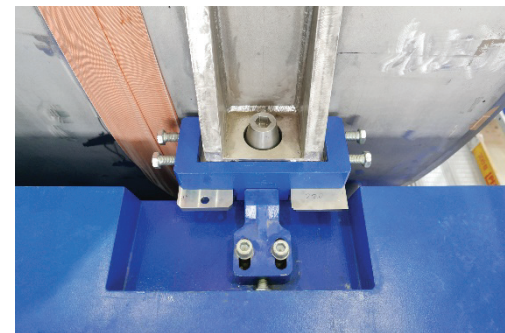
07.12.2021

ИПАС 2021, N:Топина

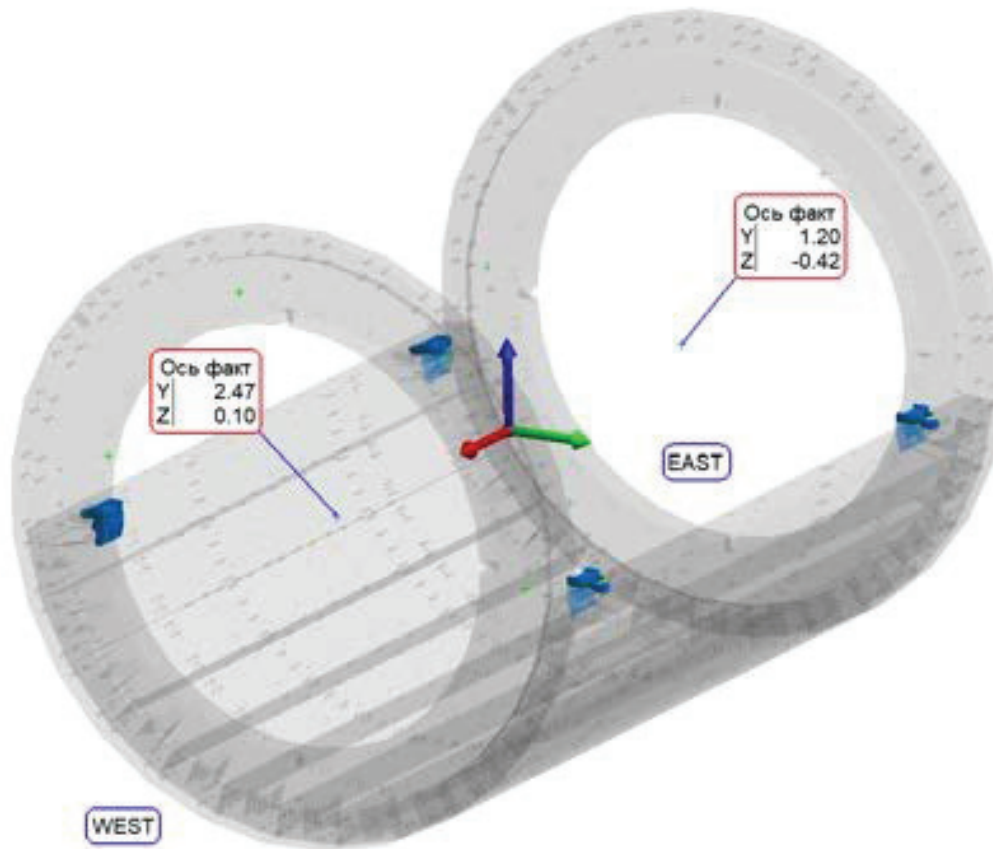
Magnet installation: July 30, 2021



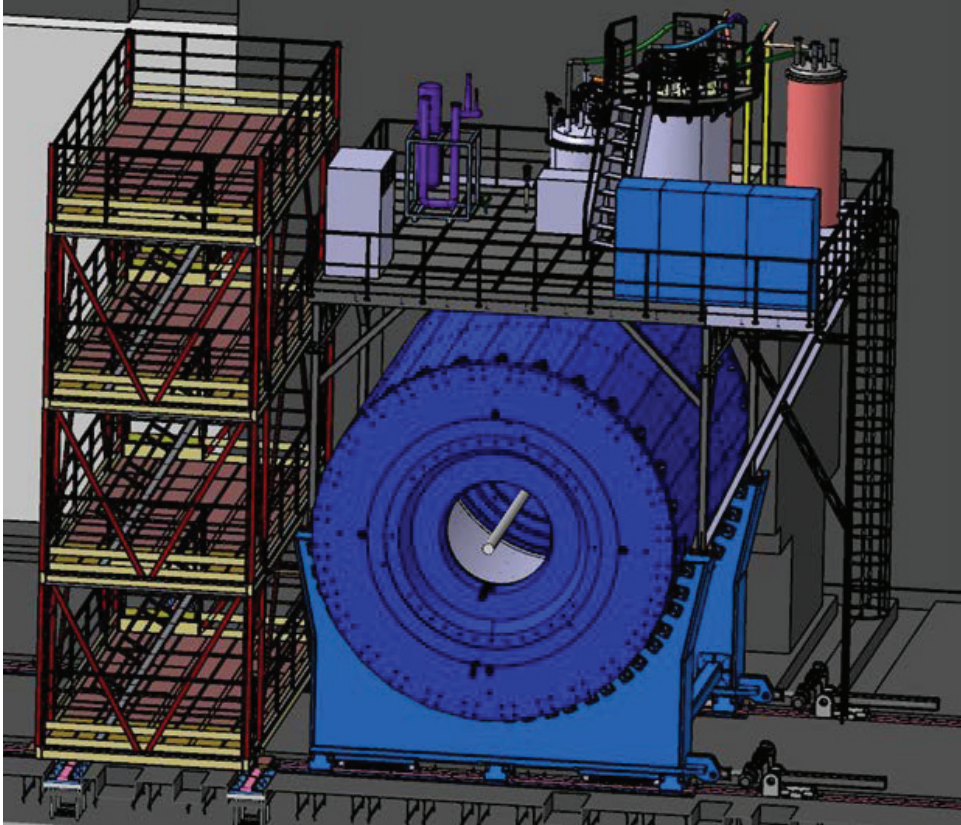
August 2020
Traverse 75 t capacity and
80 t Crane test together



The position of the magnet axis relative to the axis of the Yoke



Related tasks

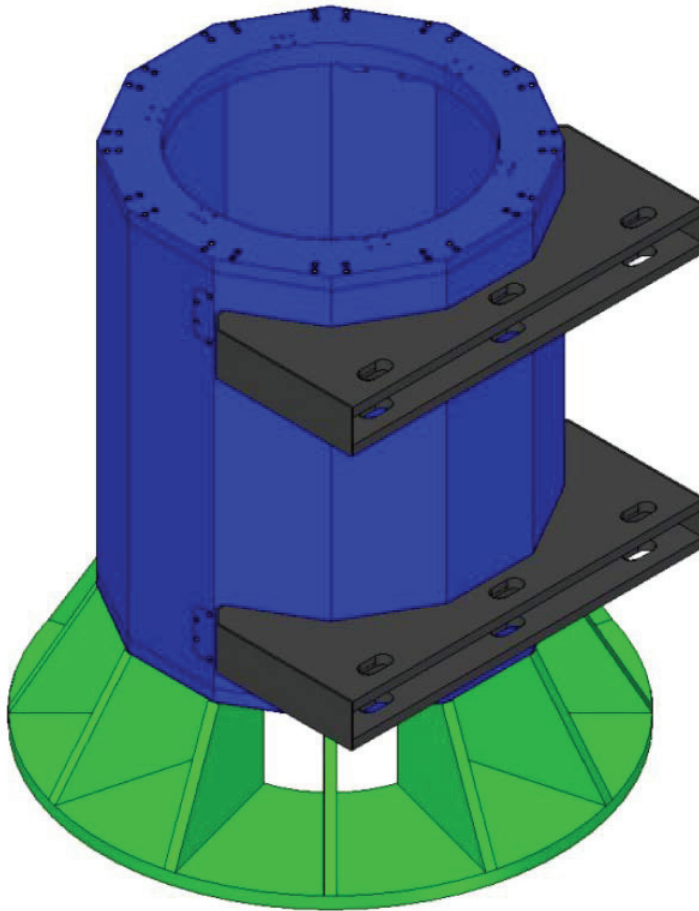


Assembling and modification
the mobile platform



Thanks for your attention !

NEVA-Magnet Yoke assembly conception



Central column + plates fixation

Lodgement supports

Scaffolding

Lifting tool

Superbolts

Position bases

Welding at JINR

Safety tool&equipment

Tall building (20-25 m or more to crane hook)

A lot of problems during assembly

On-line measurements

Others ...