



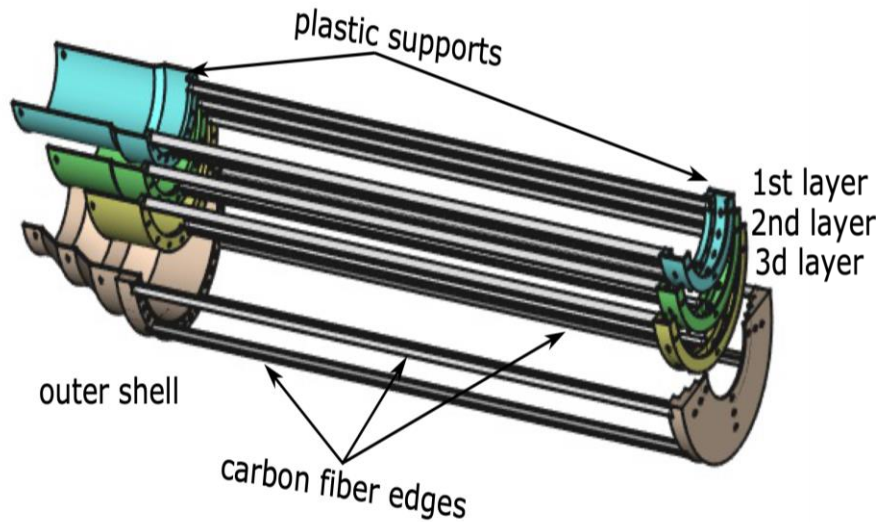
Recent results with the mechanical mockup of the ITS 3 layers based on self-supported CF longerons

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- Speaker: Dr Grigori Feofilov (St Petersburg State University (RU)),

Tuesday 28 Jun 2022, 16:00 → 17:35 Europe/Zurich

<https://indico.cern.ch/event/1176198/>

Scheme of carbon fiber support structure for ITS 3 based on CF low mass longerons (in real dimensions of the ITS3 layers)



Part of support Structure	Weight, g
carbon fiber edge	2
plastic supports for 1st layer	9,5
plastic supports for 2nd layer	10
plastic supports for 3d layer	9,5
plastic supports for outer shell	24,9

Length of carbon fiber longerons for layers: 284mm

Length of carbon fiber longerons for outer shell: 297mm

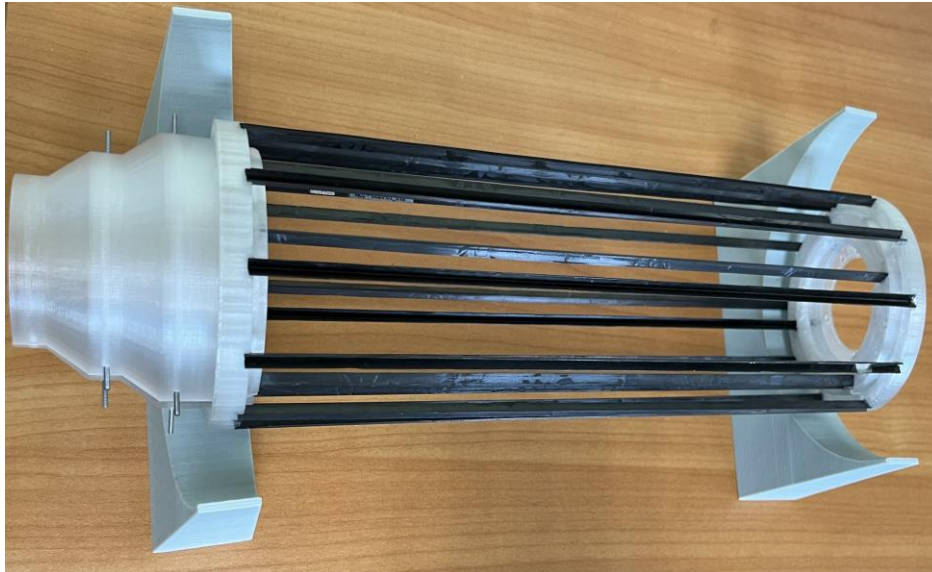
Radius of layers: layer 1 - 30mm, layer 2 - 24 mm, layer 3 - 18mm

From scheme to real life

Outer shell



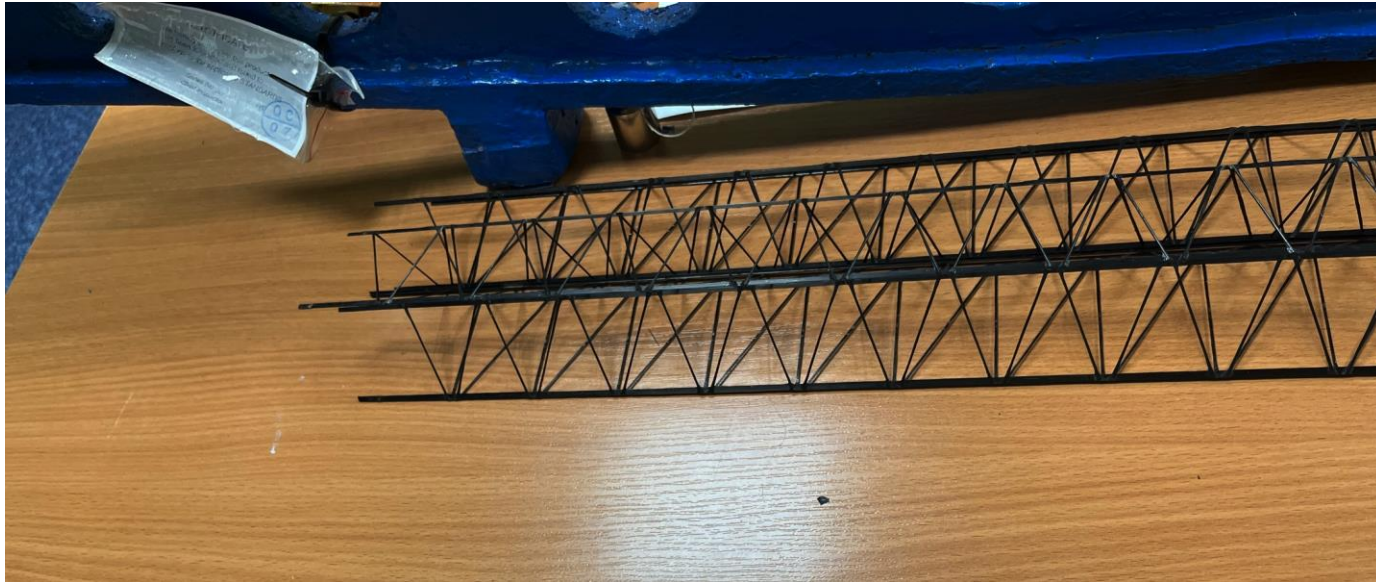
Outer shell + 3 layers



Outer shell + space blanket + 3d layer

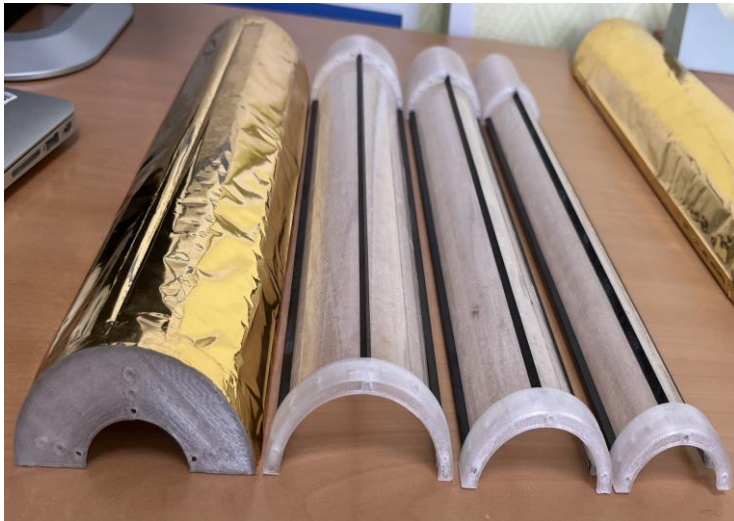


Longerons: CF ribs from the ALICE ITS 2



Assembling of mechanical mock-up of ITS-3

- Thin (100 μm) fiberglass plate as a mock-up of silicon thin large area sensor
- Mechanical properties are similar



Assembly procedure of the 3rd layer

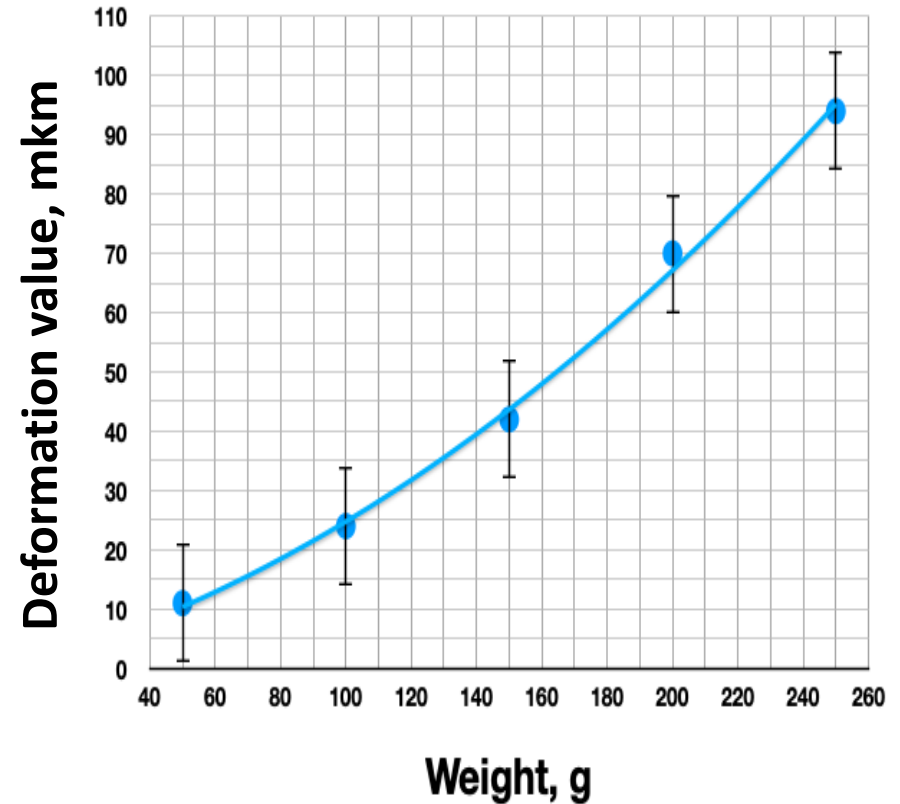
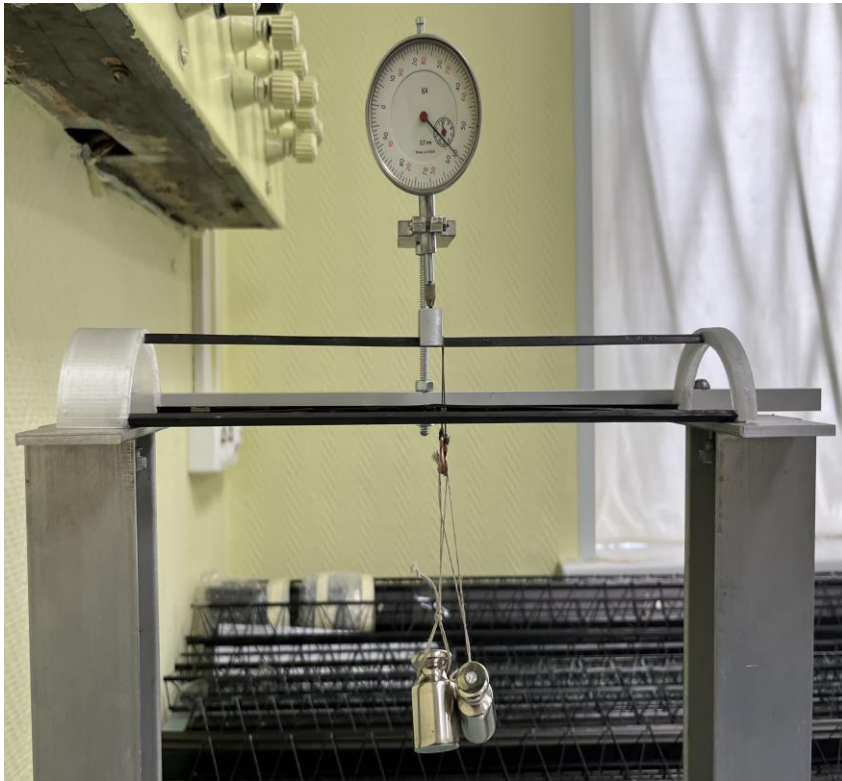
- 1) Thin (100 μm) fiberglass plate was placed around the cylinder surface of mandrel
- 2) The CF support longerons were glued to the bent mock-up





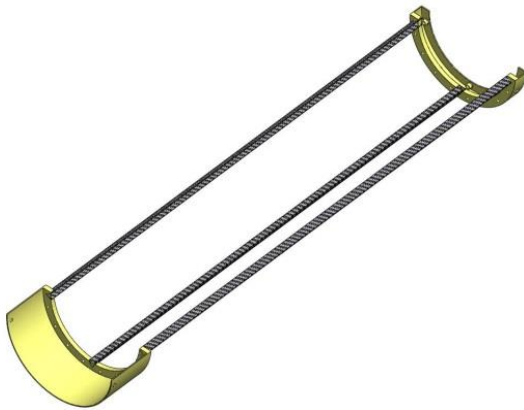
Deformation value of CF longerons under the influence of different weights

Measurements were performed by micrometer



Scheme and picture of support structure

scheme of support structure



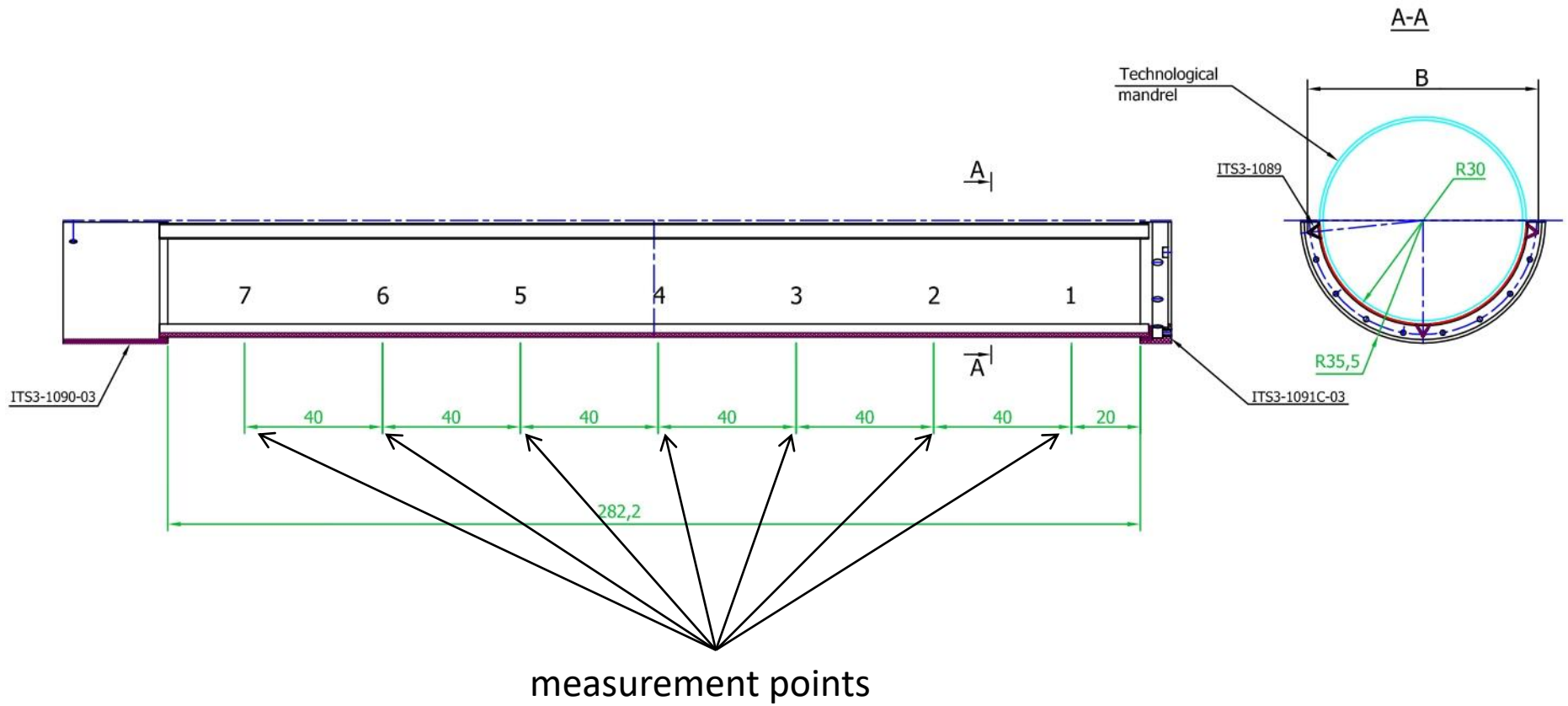
imitator of Si



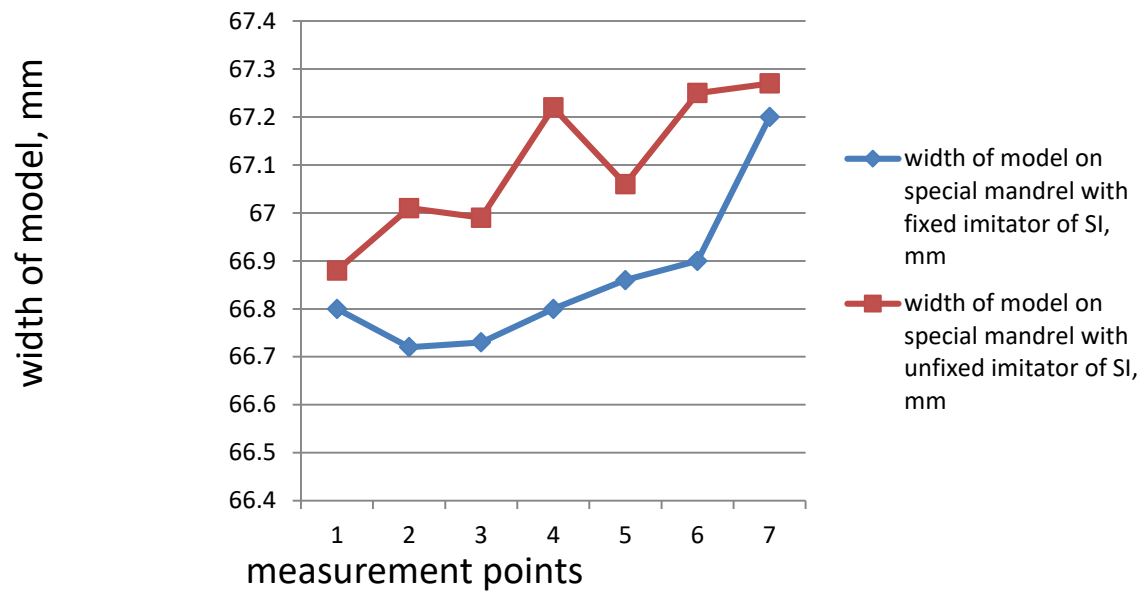
technological mandrel

support structure

Scheme of measurements



Results of measurements



Plans

- 1) Tests at CERN (Vadim Kakichev is bringing a prototype (tomorrow))
- 2) Further studies of the layout and integration with cables