

Alice overview

New detector and chamber

ALICE TC

The ALICE smaller diameter beampipe

ALICE wants to install a new beampipe in LS2. The reason is to build a new silicon tracker with greatly improved features in terms of determination of the distance of closest approach to the primary vertex, tracking efficiency at low transverse momenta, and read-out rate capabilities.

First request in LEB meeting 16.9.2010. Several options evaluated since then: outer diameter 3.4cm to 4cm, and wall thickness down to 500um.

The TDR for new ITS has recently been submitted to LHCC, and presented at the LHCC week the 2nd of December. Another detector, the MFT, has in the meantime been approved.

New beampipe ready for final LEB submission:

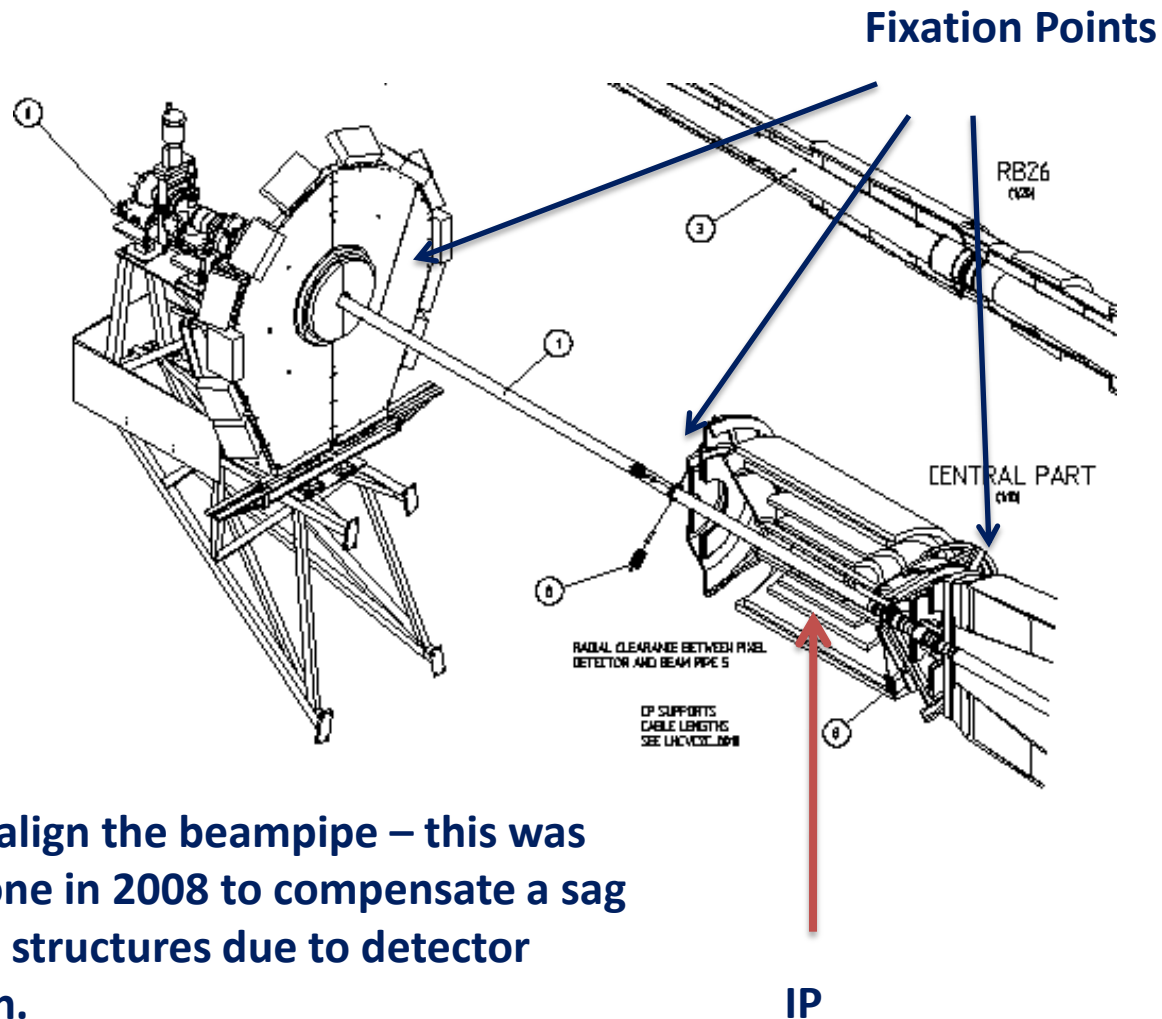
Outer diameter: 3.6cm (6cm now) and wall thickness of 0.8mm

Length: 550cm (+68cm wrt present pipe)

Bellows and flanges in Al (instead of SS)

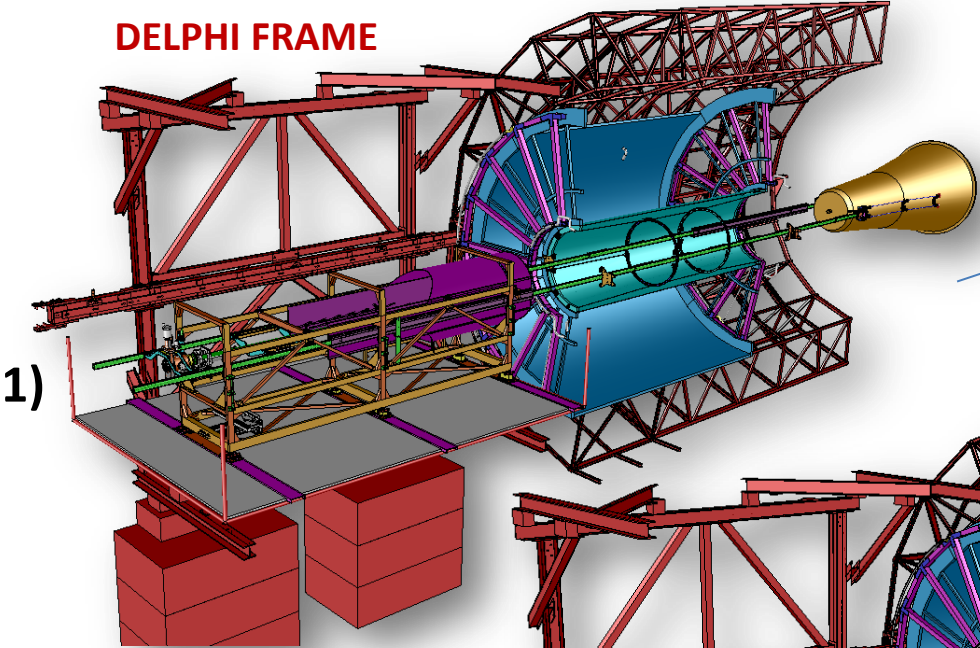
Remote bakeout

Present central beampipe



ALICE can align the beampipe – this was already done in 2008 to compensate a sag of support structures due to detector installation.

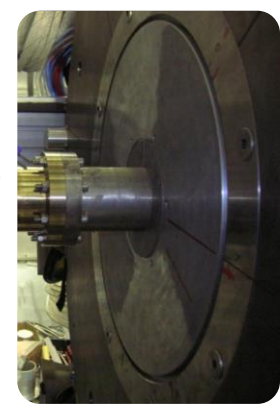
DELPHI FRAME



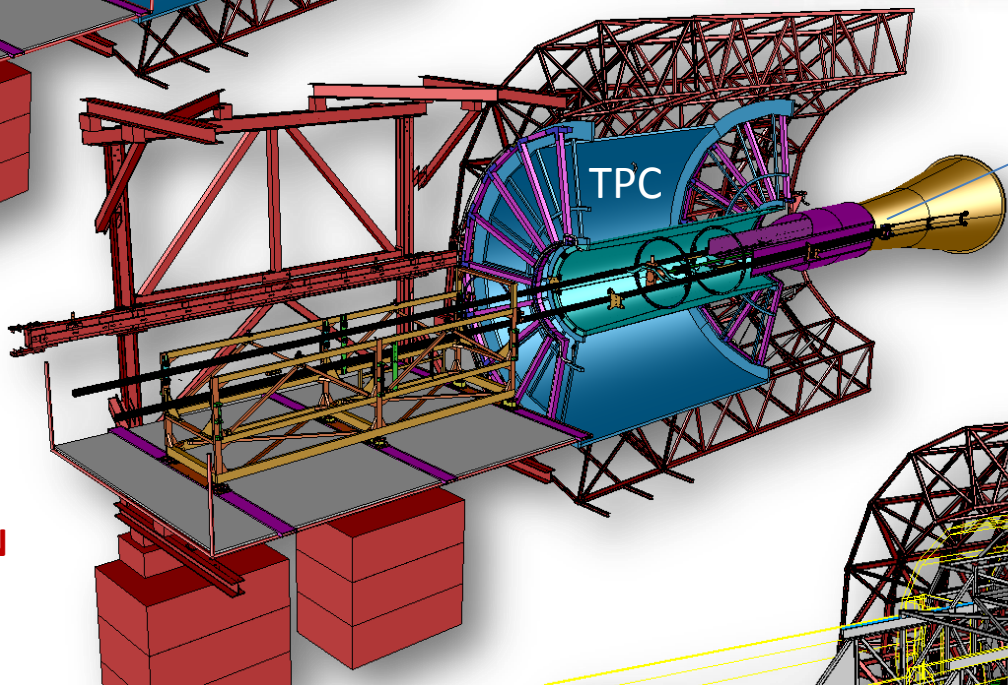
Beam pipe in the Cage



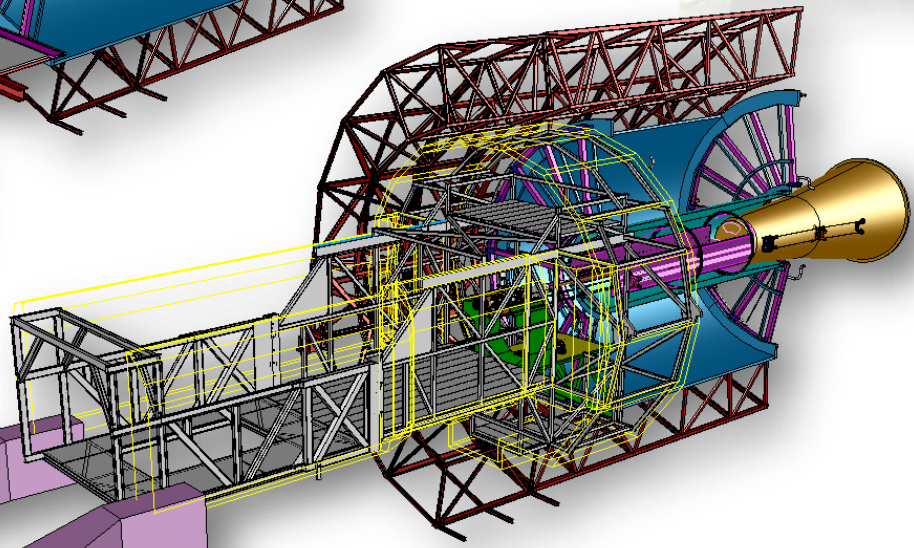
Beam pipe connection



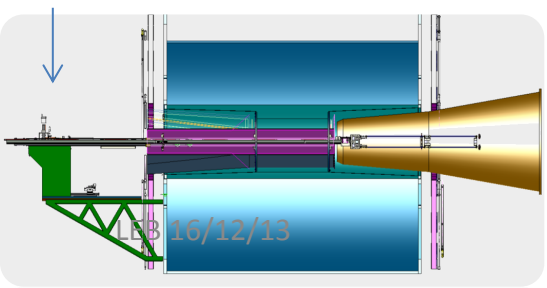
CAGE OUT



CAGE IN

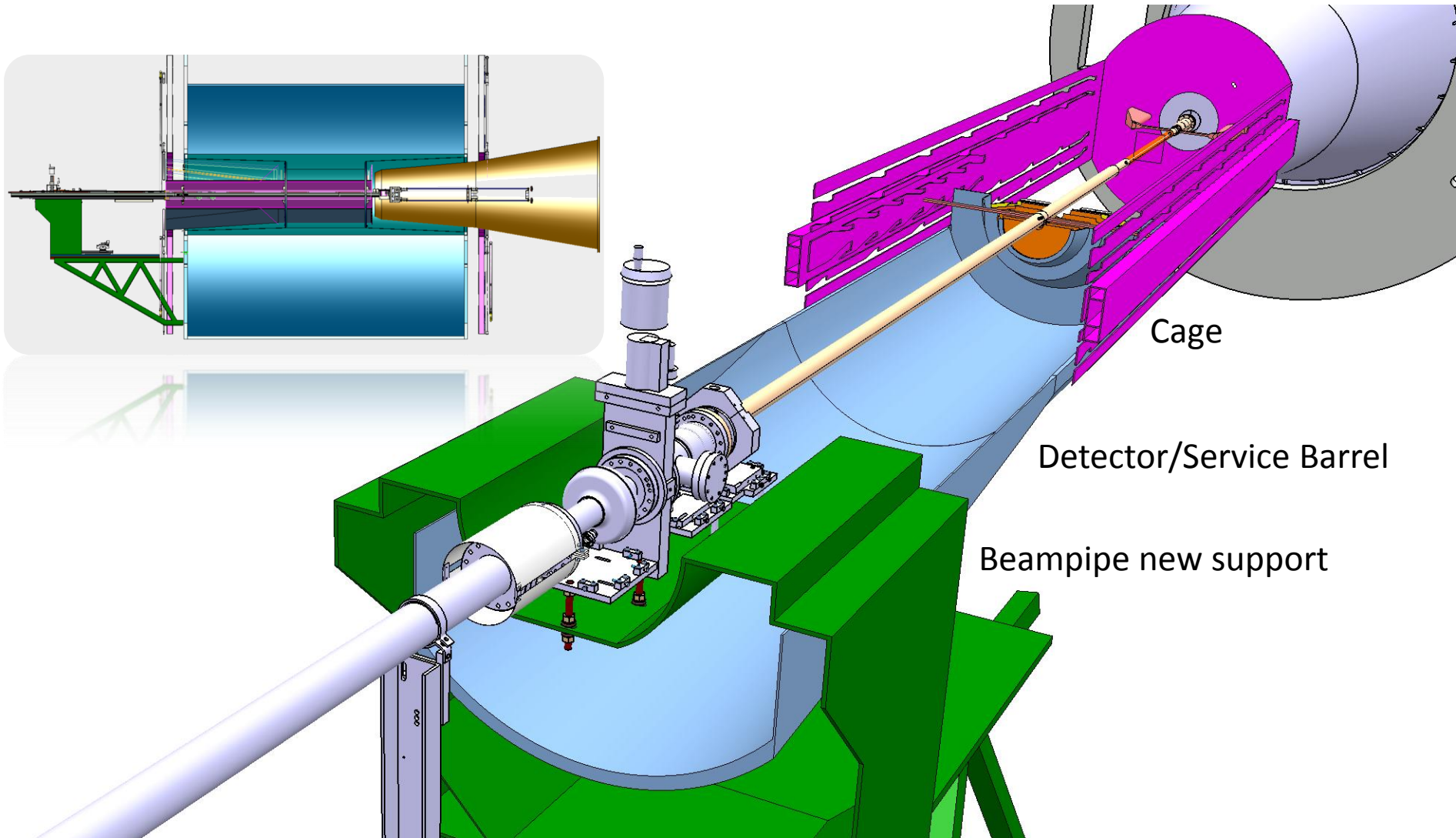


Beam pipe external support

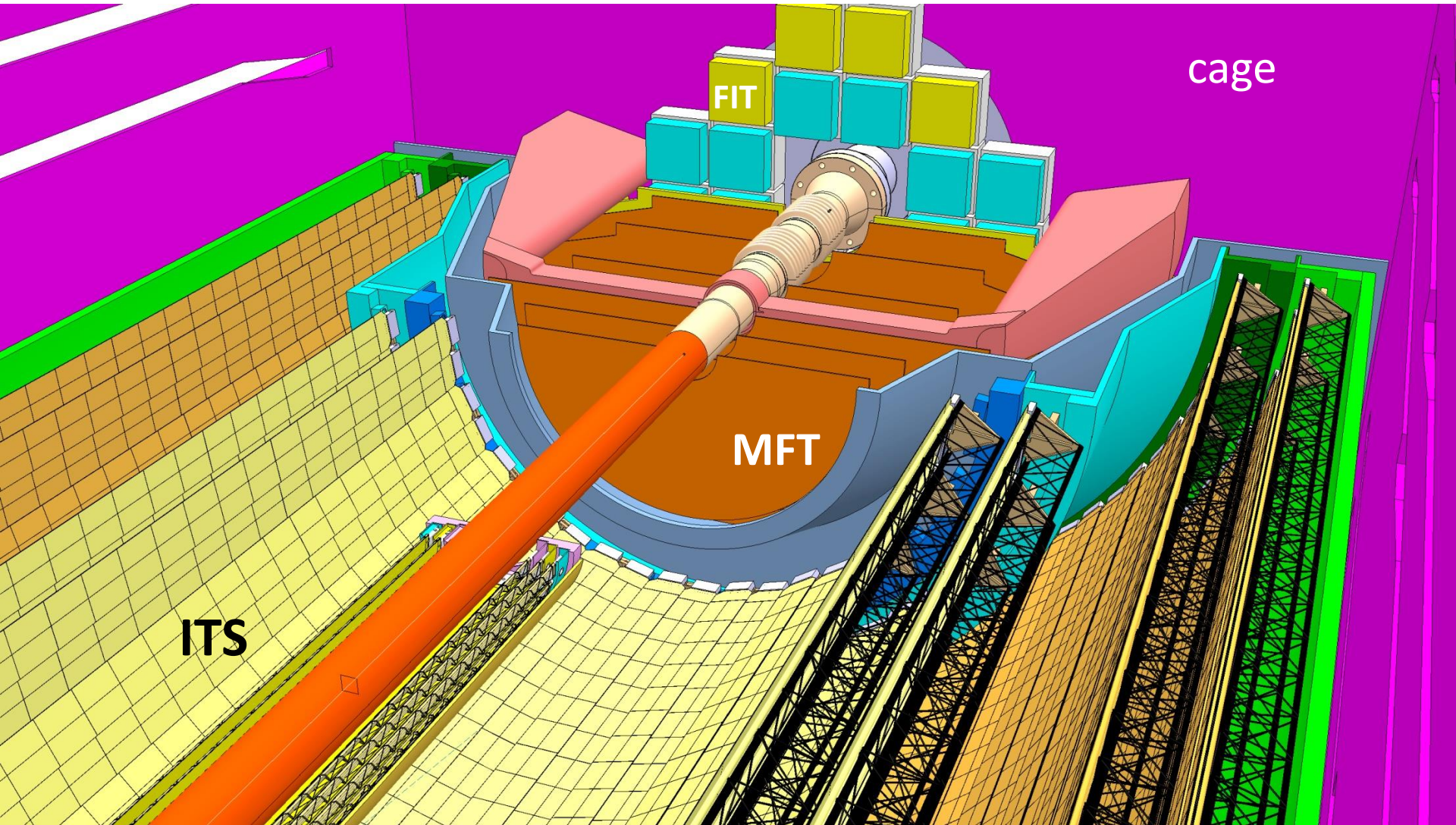


Alice overview- New detector and chamber **MINI FRAME**

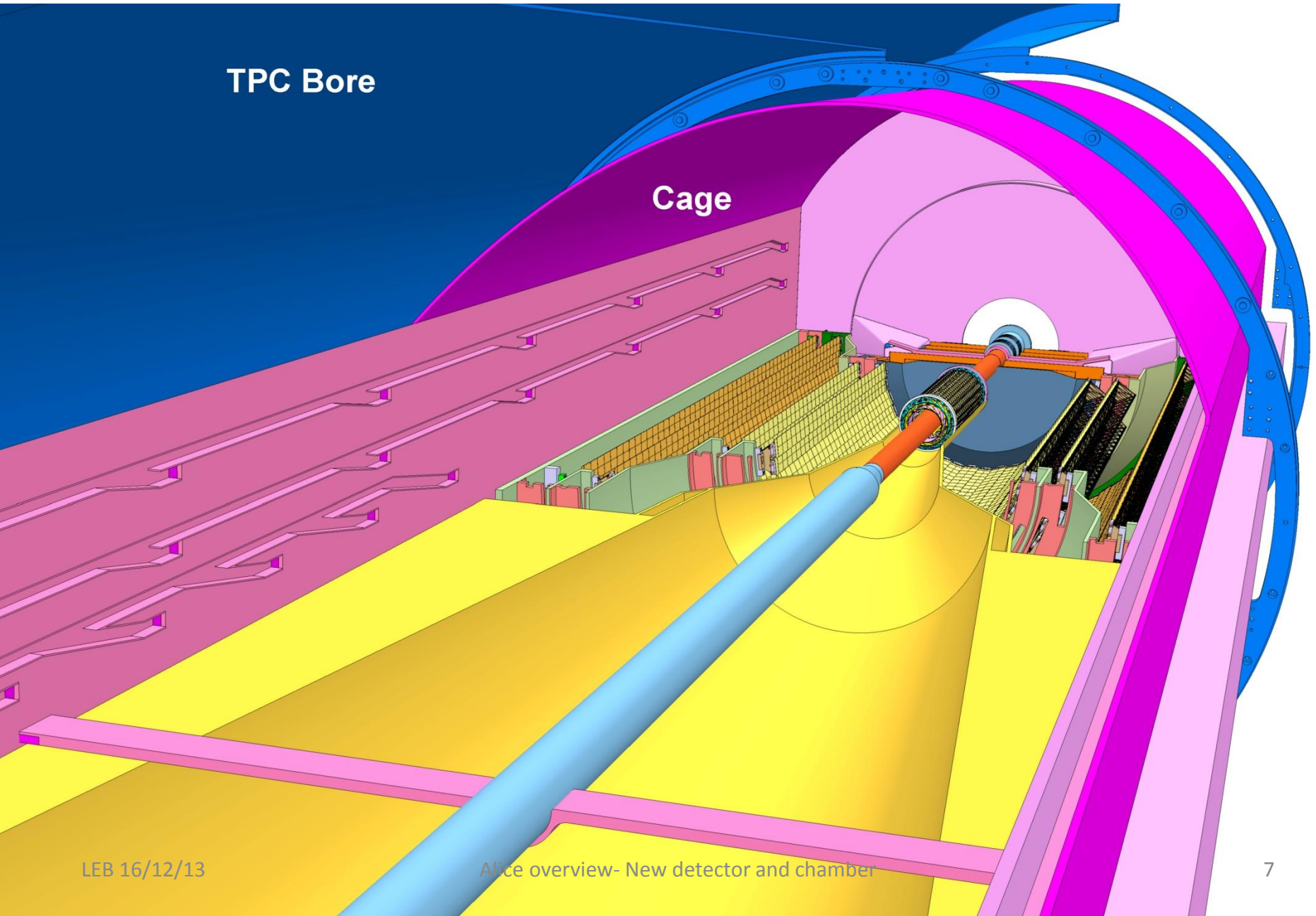
New layout



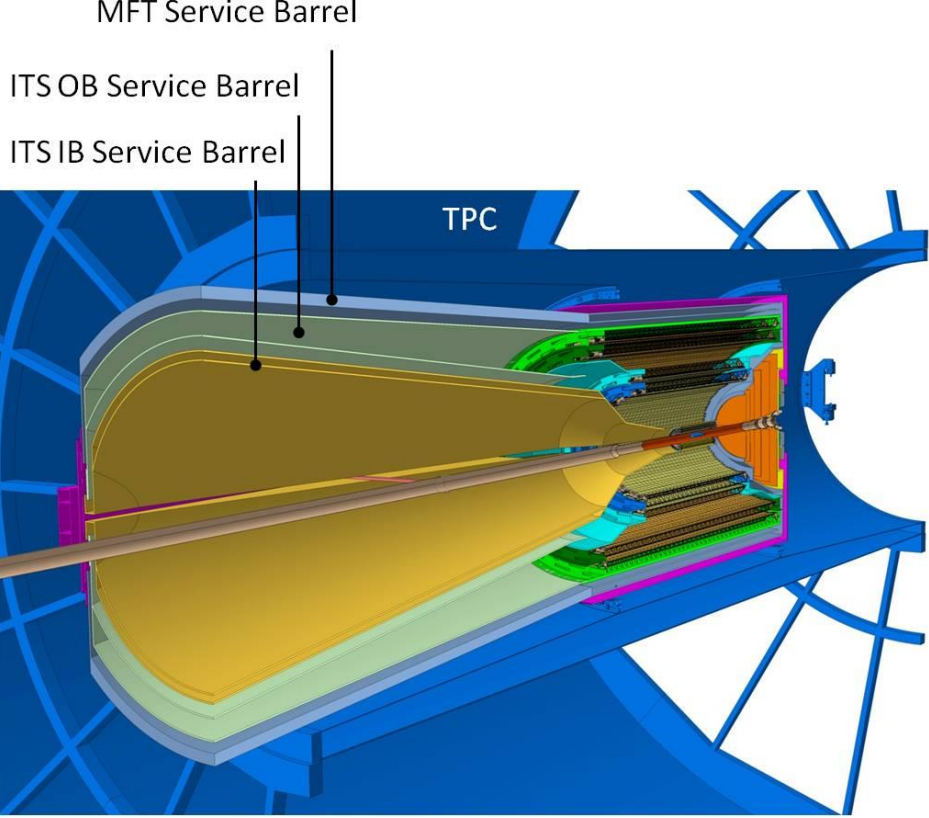
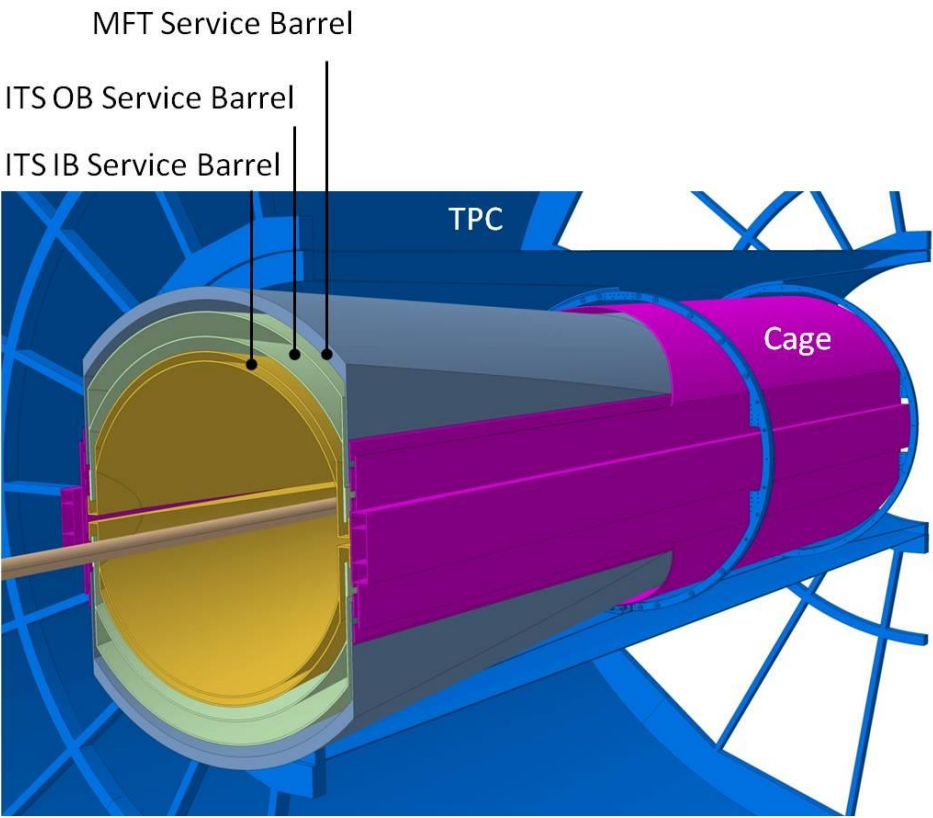
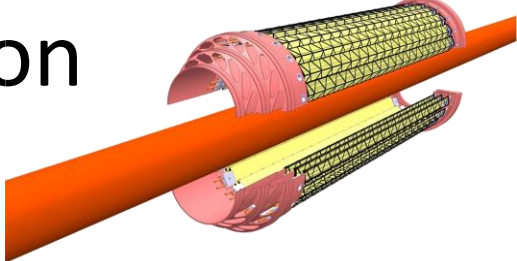
ALICE beam pipe central section, C-side



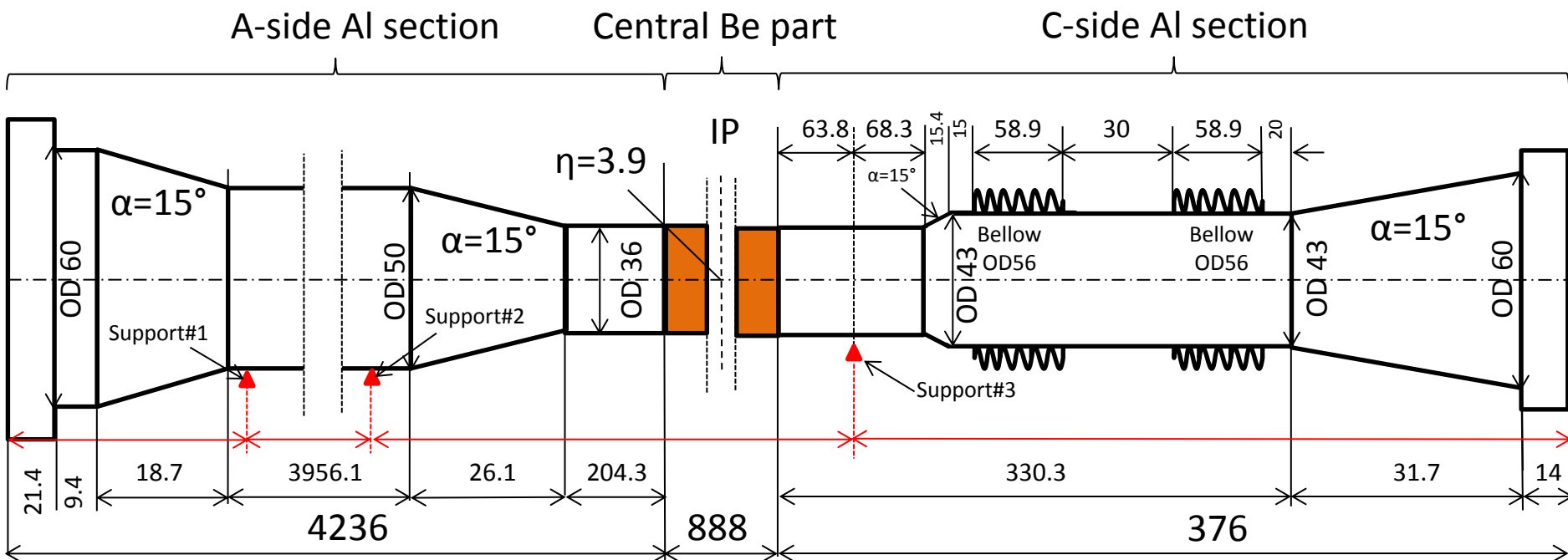
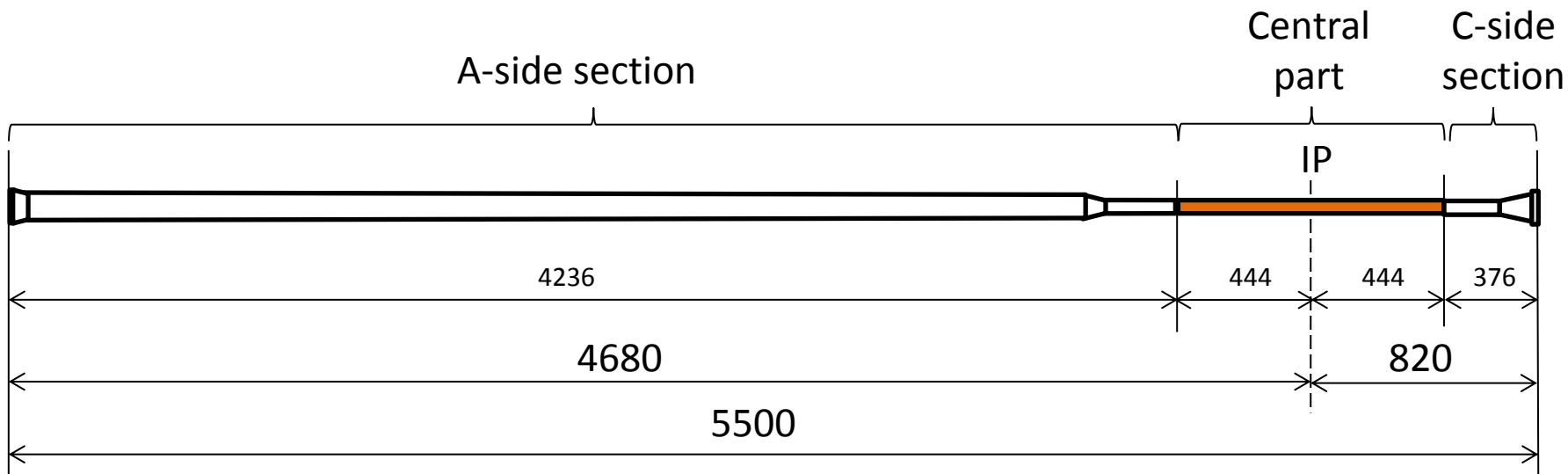
ALICE beam pipe central section



ALICE beam pipe central section



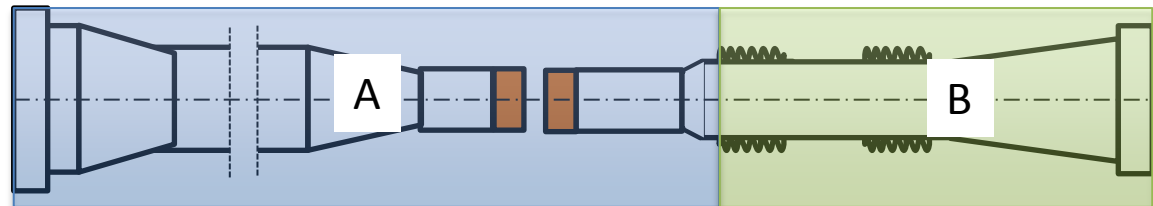
Layout new ALICE central beampipe (LS2) v6



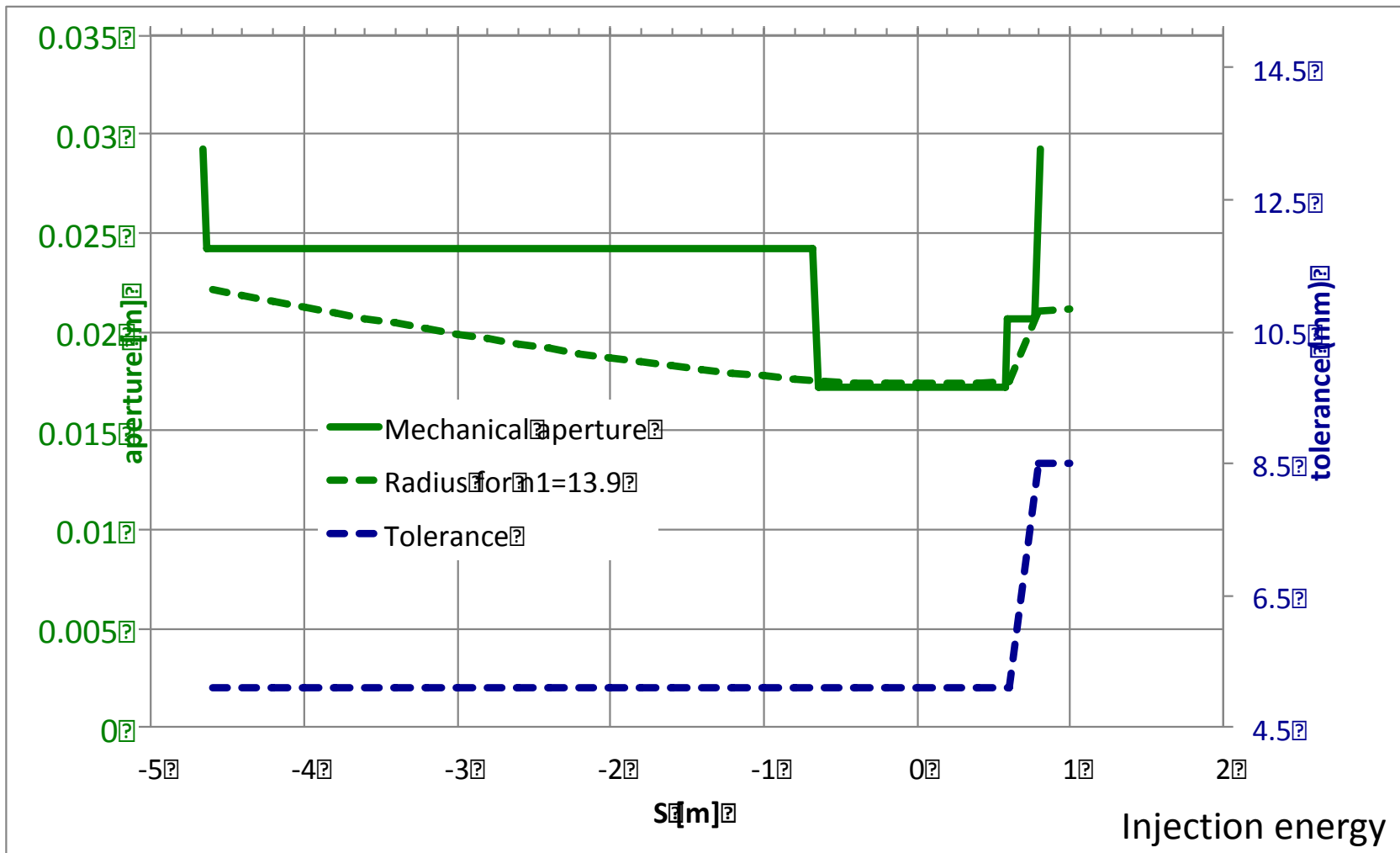
Tolerances

Quantity	Central part (A)	C-side part (B)
Construction and deflection	0.6mm ⁽¹⁾	0.5mm
Mechanical adjustment precision	1.5mm ⁽²⁾	0.5mm
Survey to beamline uncertainty	1.5mm ⁽³⁾	
Quad fiducial to beamline uncertainty	0.5mm ⁽³⁾	
L3 movement	<0.5mm ⁽⁴⁾	
B field movement	<0.5mm	<5mm
Linear sum	5.1mm	8.5mm

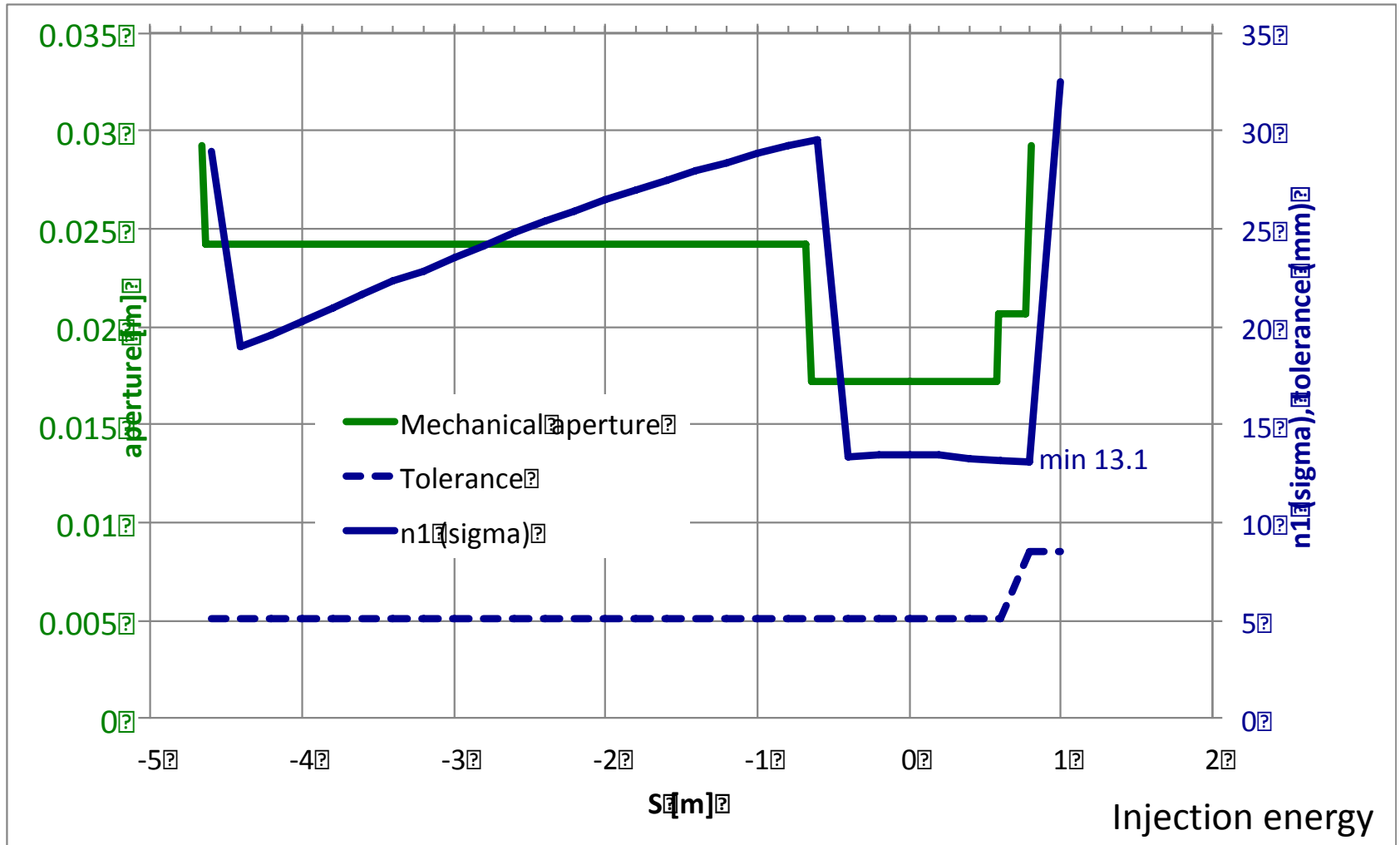
- 1) LEB 21.3.12
- 2) LEB 4.11.10
- 3) LEB 22.2.12
- 4) LEB 23.3.12



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Conclusions

- ALICE wants to install a new beampipe in LS2, with central section, 3.6cm OD and 88.8cm long, in Be
- The tolerances are 5.1mm (central part) and 8.5mm (C-side part)
- With these tolerances the n_1 min (at injection) is around 13.1 sigma, and is located at the C-side of the pipe → to be confirmed by Massimo