VAXBOXs

Antonio Alonso, WP8 (Collider-Experiment Interface)

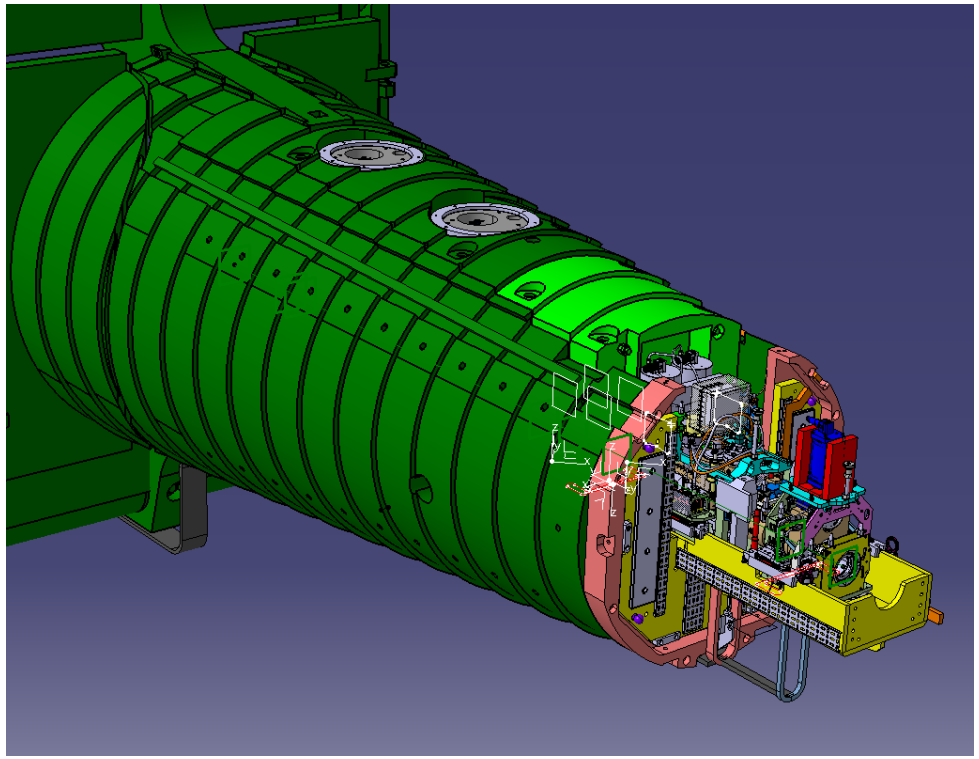
Thanks to F. Sanchez, O. Boettcher, D. Brethoux and F. Luiz

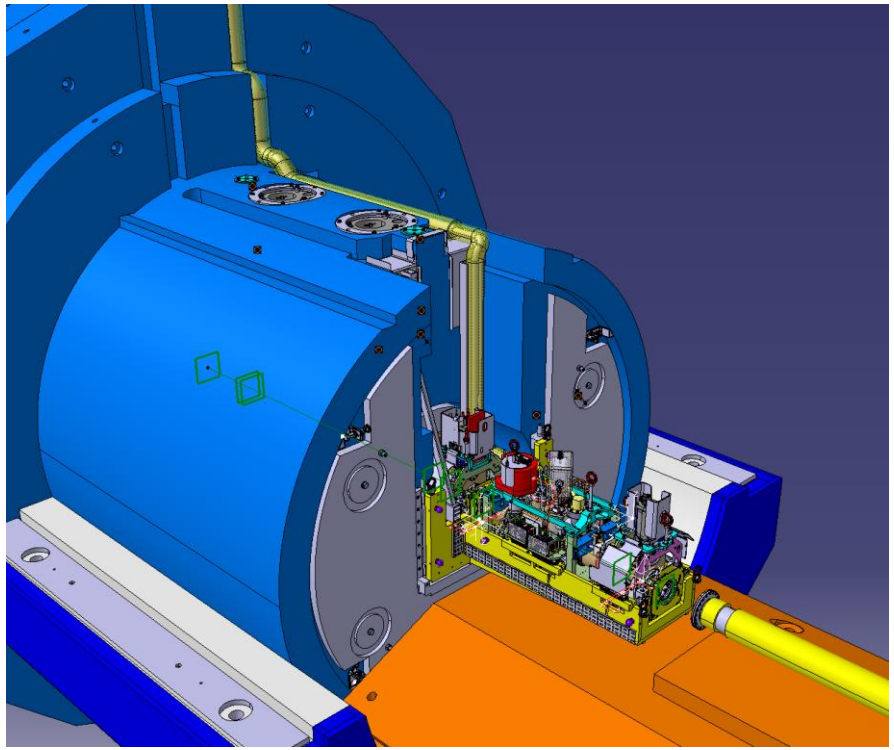
Special thanks to the collaboration of J. Perez, E. Barnes, S. Di Giovannantonio, M. Perez, G. D'Ago, D. Mergelkuhl

WP8 – COLLIDER EXPERIMENT INTERFACE

- CMS VAXBOX
- ATLAS VAXBOX

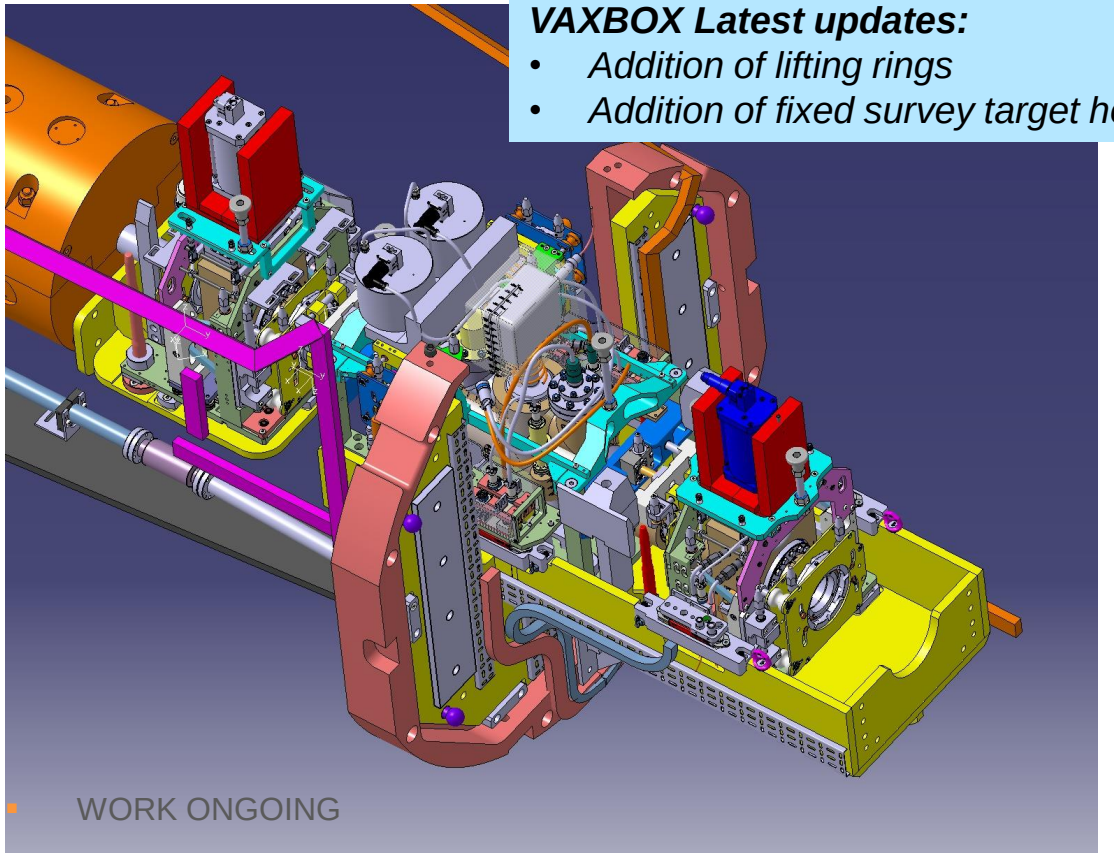
The ATLAS and CMS VAXBOXs are supports to hold the VAX M2 & M3 modules, they are attached to the ATLAS and CMS shielding through support plates and will hold the modules and their services inside the narrow shielding envelope





CMS VAXBOX Schedule

- Recent updates for the New CMS VAXBOX
  - Lessons learned from current VAXBOX and workshop tests
  - New staubly connectors
  - New services lines
  - New modules
  - Improved alignment system
  - Improved survey system
  - Improved module connection
- Mechanical calculation with the new loads
- Update the Prototype VAXBOX in Workshop 867 to the new geometry – ET Mid November
- Test with final configuration –ET Beginning 25
- Built the new CMS VAXBOXs or modify the current ones
- To be ready Including Staublis -Q1/27



VAXBOX Latest updates:
- *Addition of lifting rings*
- *Addition of fixed survey target holes*

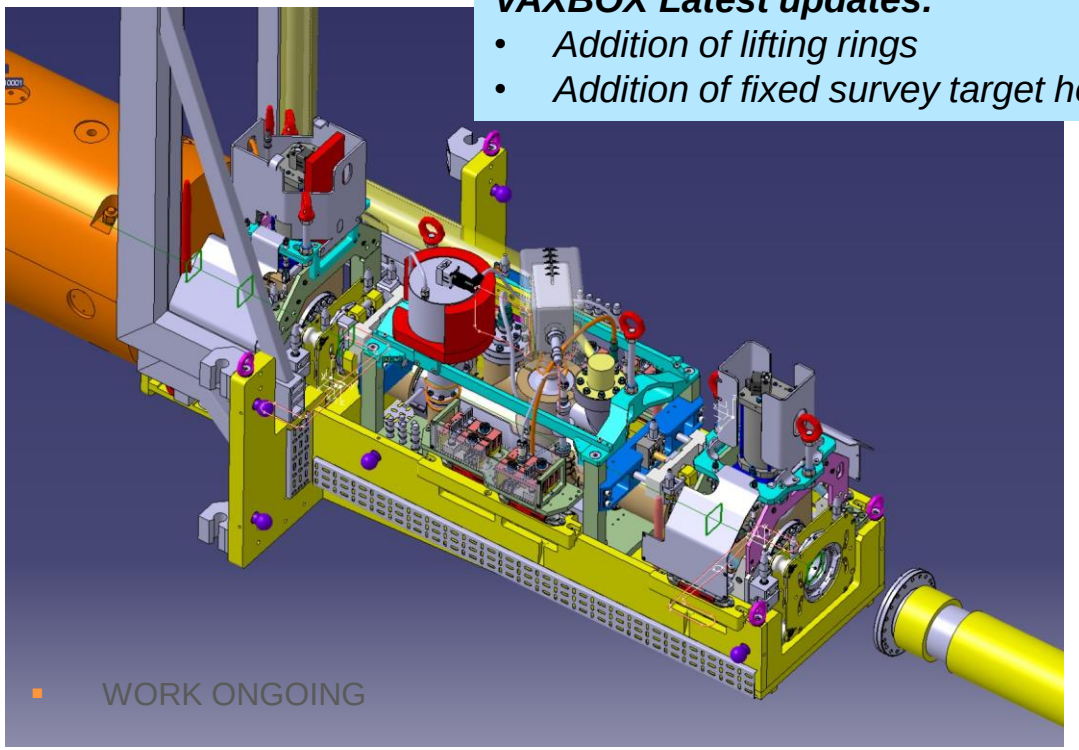
Inputs needed:
- *Final weight and center of gravity of M1, M2, M3*
- *Final weight and center of geometry of the Ion pump & support*
- *Service lines for the Ion pump*

To discuss:
- *Interface VAXBOX- Ion pump support*
- *Improving of alignment procedure and geometry (Lessons learnt from deformation test)*
- *Compress air tubes routing -Meeting tbd 15/10*

ATLAS VAXBOX Schedule

- Recent updates for the the New ATLAS VAXBOX
  - Lessons learned from current VAXBox and workshop tests
  - New staubly connectors
  - New services lines
  - New modules
  - Improved alignment system
  - Improved survey system
  - Improved Module connection
- Mechanical calculation with the new loads TO BE DONE
- Manufacture the new ATLAS VAXBOX Q2/26
- Test with final configuration
- To be ready including Staublis Q2/27

VAXBOX Latest updates:
- *Addition of lifting rings*
- *Addition of fixed survey target holes*



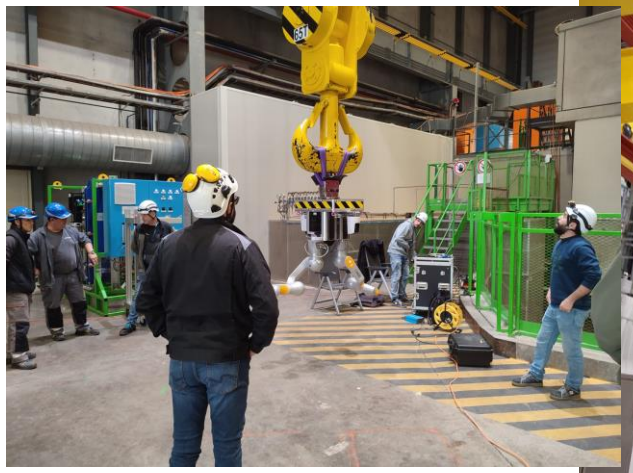
Inputs needed
- *Final weight and center of gravity of M1, M2, M3*
- *Final weight and center of geometry of the VJ cone*
- *Service lines for the VJ cone*

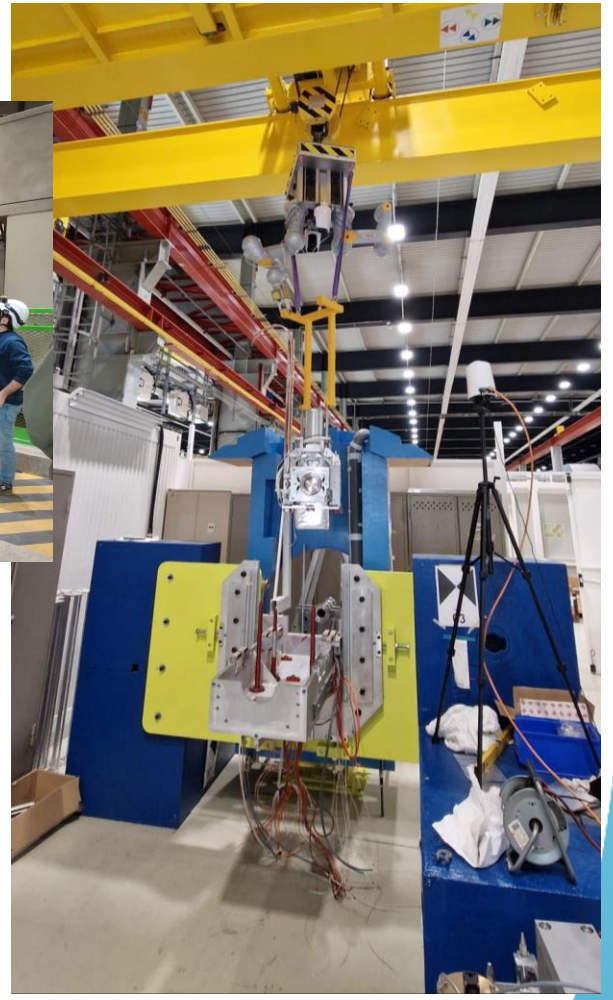
To discuss :
- *Interface VAXBOX-VJ cone support*
- *Improving of alignment procedure and geometry (Lessons learnt from deformation test)*

TEST CAMPAIGN

- Robot test (DONE 21/09/23)
- Robotic test day 2 (DONE 10/10/23)
- VAXBOX Deformation test (DONE 11/01)
- Robot crane oscillation test in SX2 (DONE 19/02)
- Robot screwdriver test (DONE 16/04)
- Pre-test to check lifting beam descent (DONE 20/09)

- Robotic module insertion test, featuring: (DONE 25/09)
  - New lifting beam by transport
  - Structure tilted
  - Changes in interface robot-module
  - New longer M1 guiding columns
  - Lifting Mushrooms





TEST CAMPAIGN LESSONS LEARNED

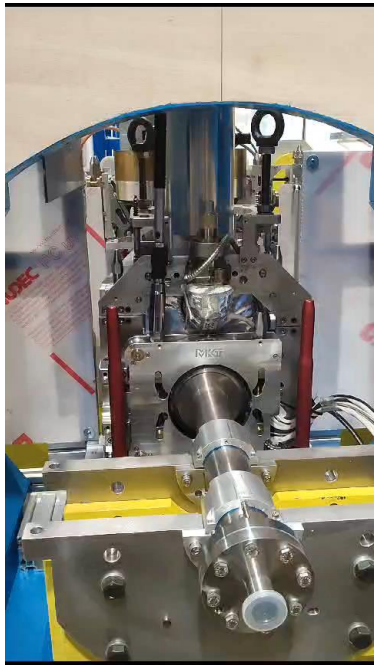
TEST 25/09/24

- To study the possibility to implement bumpers in the front part of M1 to enter in contact with the shielding → WP8 to see if it is possible to increase the envelope
- WP8 to discuss the possibility to do a test in ATLAS or CMS
- EN-HE + TE-VSC to implement small modifications in the geometry of the mushrooms
- TE-VSC to address the possibility to have the lifting points of M1 in a perpendicular axis to the beam line, to ease the crane operations
- To discuss improvements for M2 lifting beam and the need to optimize the current lifting beam to M1 and M3
- To discuss a solution to avoid any potential clashing between M1 and the TAS flange
- WP8 to provide the new envelope
- A good new thing was the different of height between the two guiding pins → to implement the same solution of the rest of the modules
- The snorkel solution for the cables worked good during the test

Thanks to M. Perez for summarizing these points

TEST CAMPAIGN – NEXT DATES

- Pre-test to check inclined module descent (15/10)
  - Verify the influence of the crane rotation and shimming on the module smooth insertion
- VAX Modules interconnection test (16/10)
  - On this test, the robotic screwdriver presented by S. De Giovannantonio will be used to extend the bellows and connect the modules between each other with the remote connection system.
- Old CMS VAXBOX bolt preload deformation (Dirk-Josef) (ET-End November)
  - The old CMS VAXBOX was recovered, and an alignment test will be done to test the behaviour of the old design to the alignment and fixation procedure
- Test with the new Staubli pins and supports (Q1 2025)
  - The VAXBOX and modules will be updated to the latest version of the staublis, to verify its behaviour under those new conditions



Future tests

- *Module connection with vacuum*
- *…Open to any requirement*

A big THANKS for this collaborative effort!

Without you those test could have never been possible