



# THE CLIC MODULE FABRICATION

MEETING #8

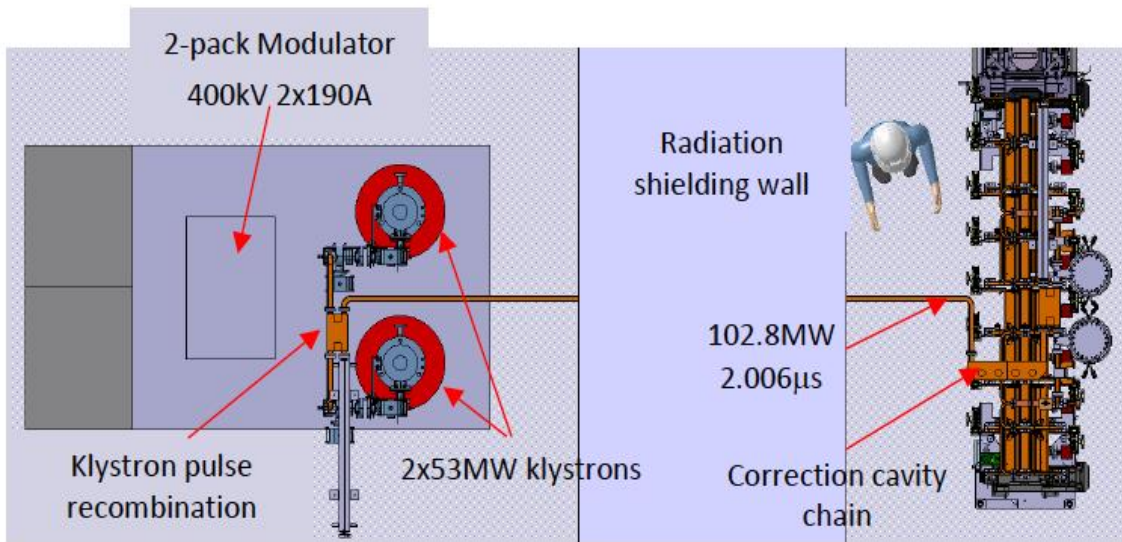
RF development and short term program– 19 January 2021

## SUMMARY OF MEETING #7

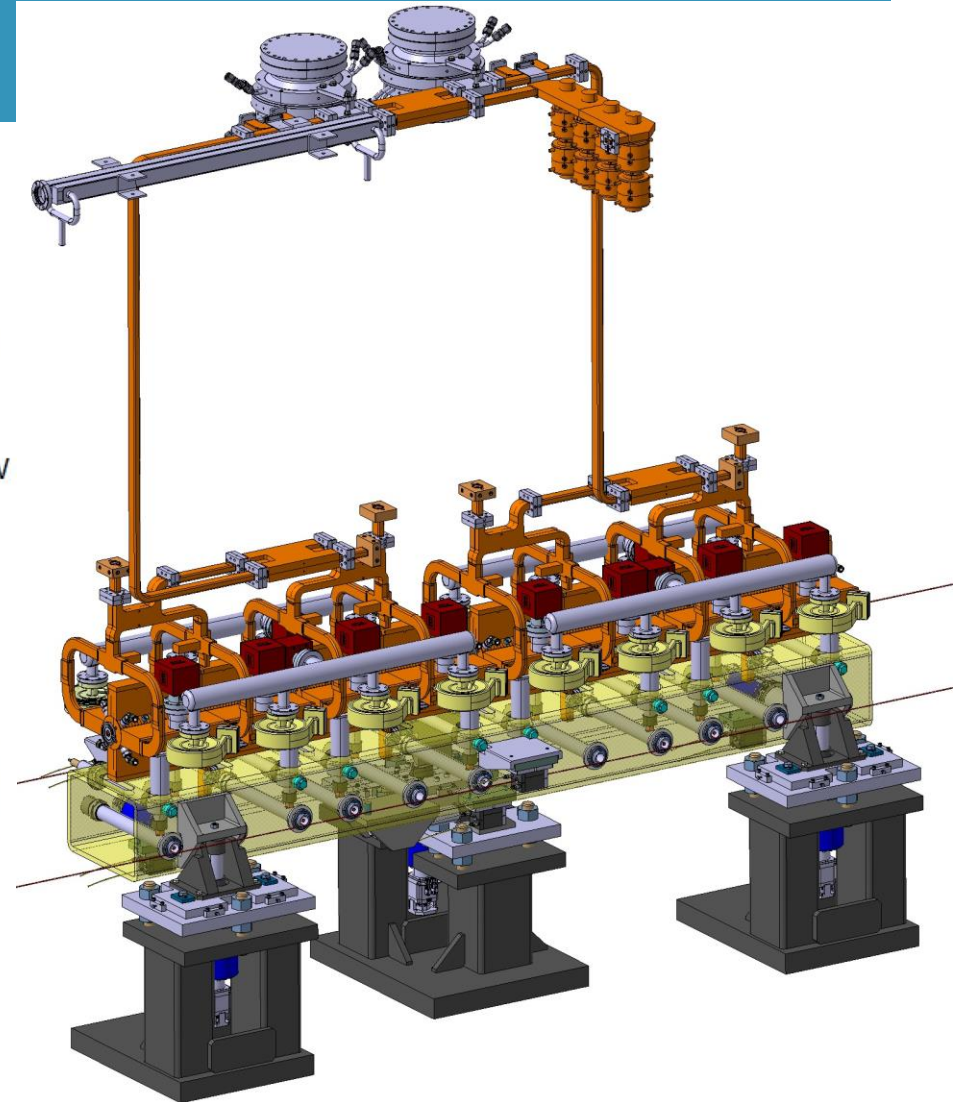
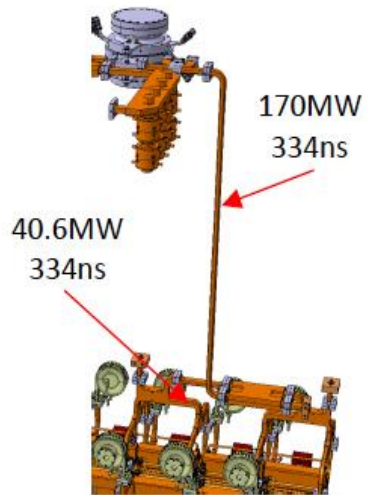
- The proposed experimental program was presented, which has been articulated in 3 areas: **Integration, mechanics and alignment; Thermo-mechanics and RF conditioning; Operation with beam (in CLEAR)**.
- A first scheduling and costing spreadsheet was illustrated: the total cost for the full program was estimated at 7 MCHF, including personnel cost; however items related to the technical infrastructure were not included yet.



# K-RF UNIT



BOC cavities  
x 3.5 pulse compression



# RF DEVELOPMENTS

MEETING ON 14.01

- Choose a SAS geometry and complete the design of a 380 GeV K-based SAS;
- Design an integrated input / output RF power coupler;
- Decide the flange type to connect to waveguide network;
- Decide about WFM.

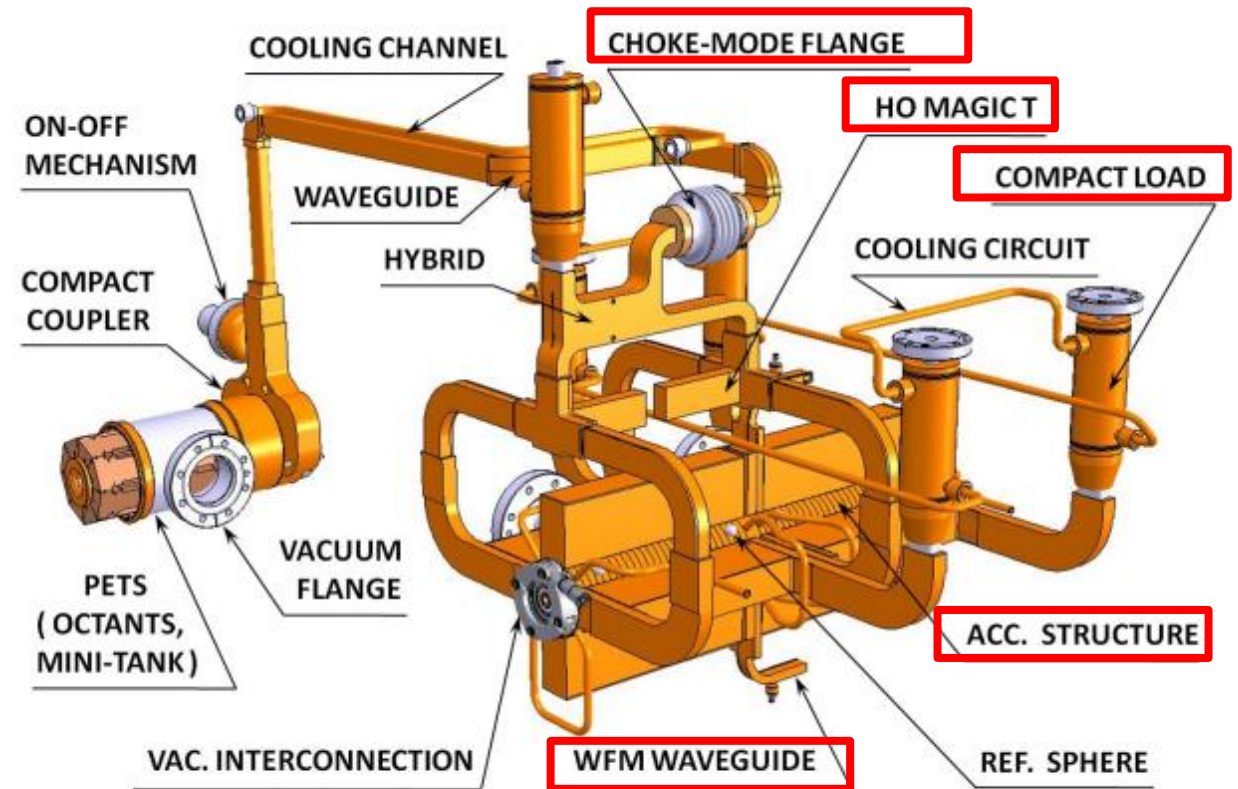
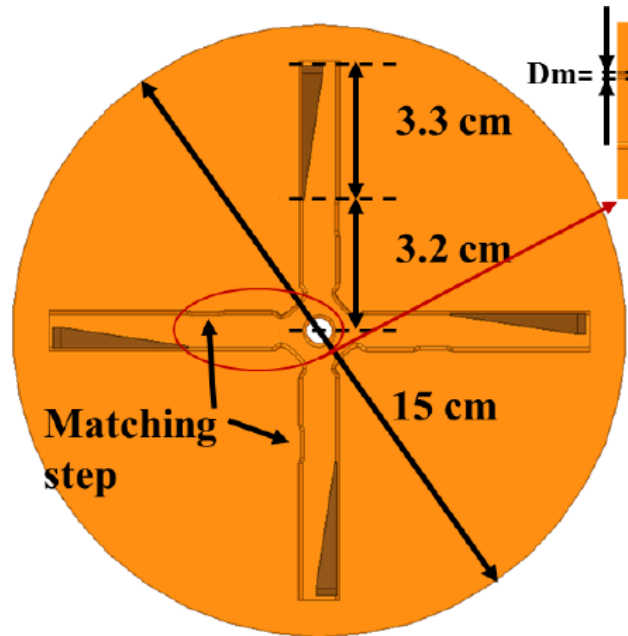


Fig. 5.126: Schematic view of the CLIC module RF system

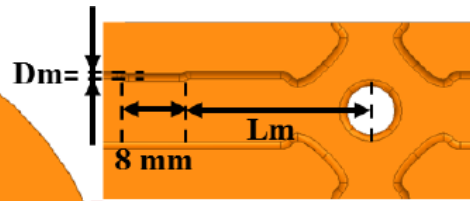




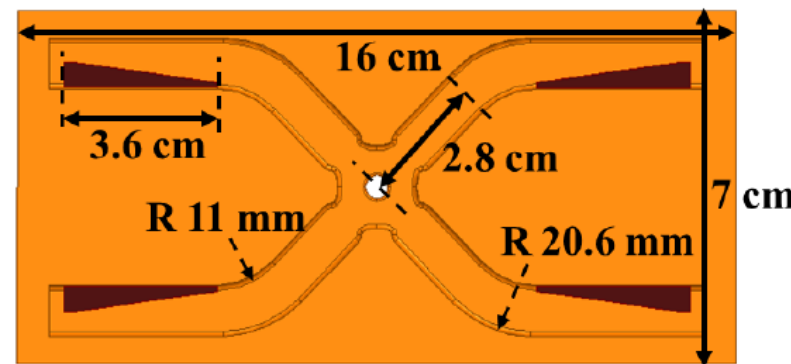
# RF DEVELOPMENTS - Effectiveness of wakefield suppression



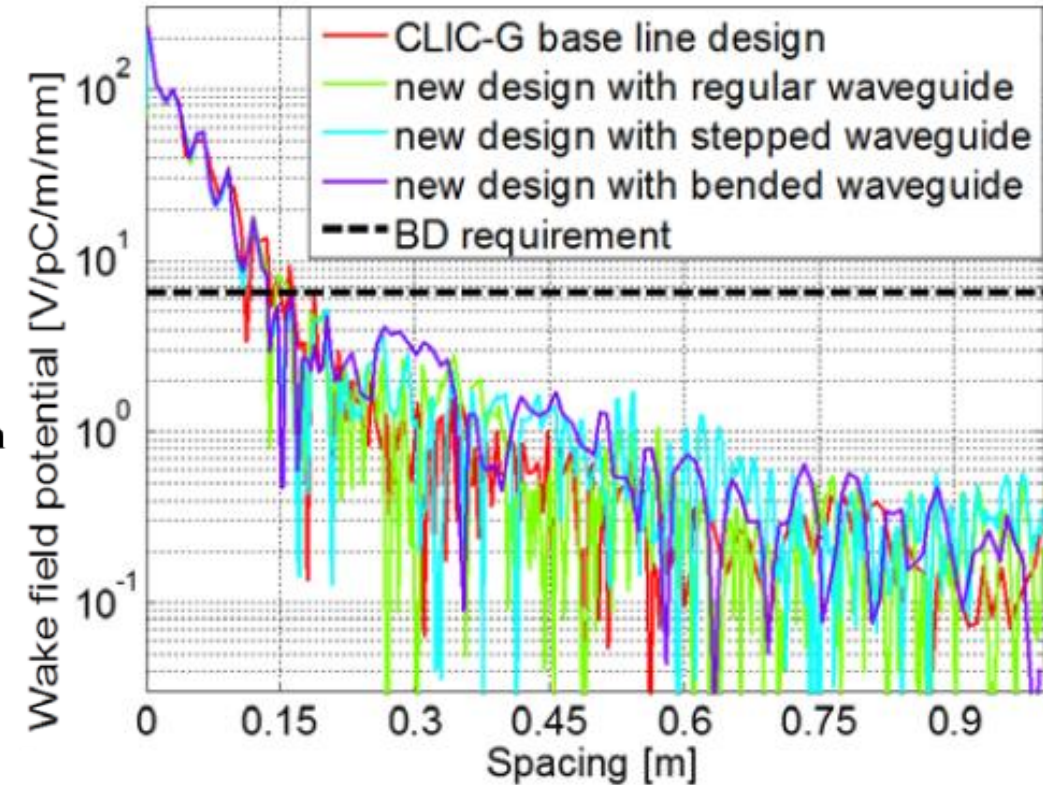
CLIC-G\* cell with stepped damping waveguides



Cell	First	Last
Dm	0.3 mm	0.04 mm
Lm	28 mm	18 mm



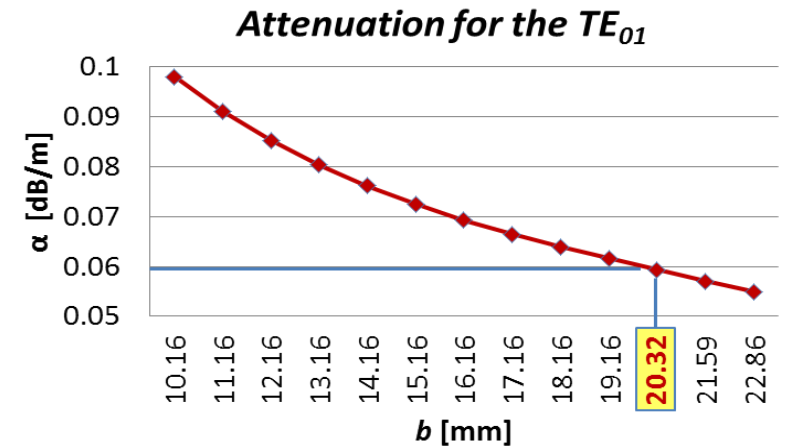
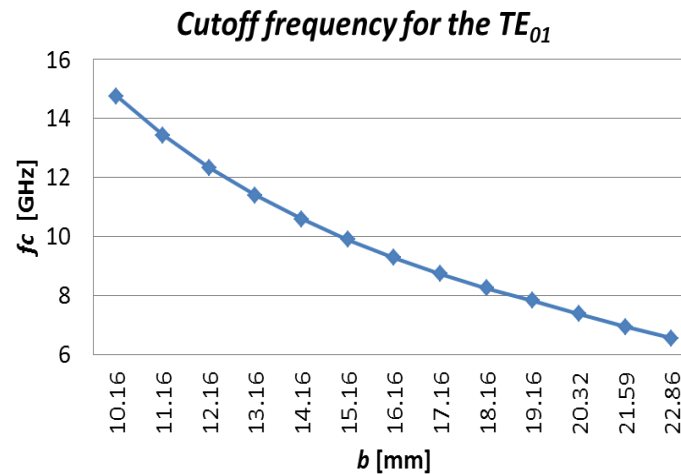
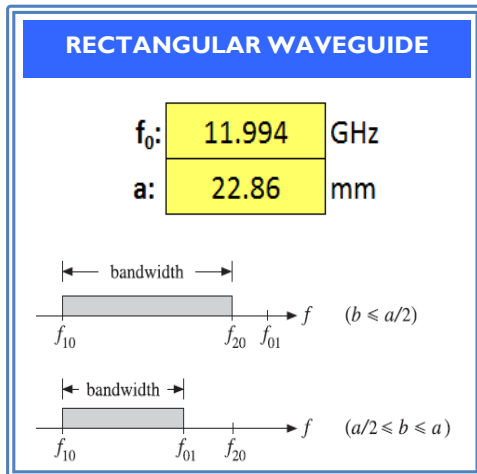
CLIC-G\* cell with bended damping waveguides



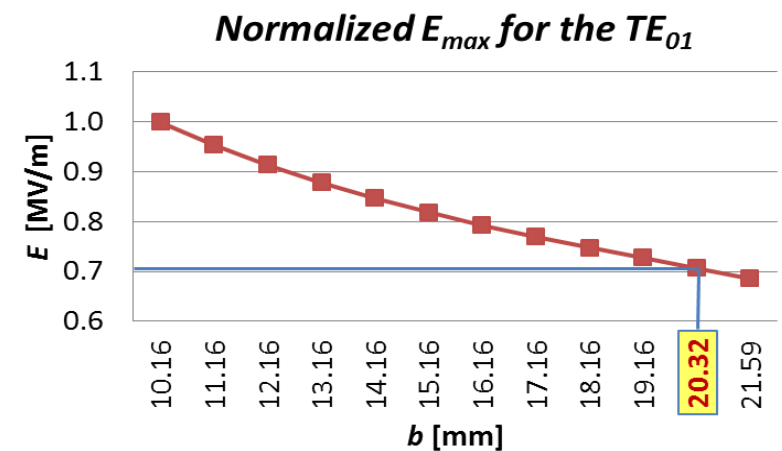
H. Zhao and A. Grudiev CLIC – Note - I066



# RF DEVELOPMENTS - Optimization of the waveguide network



Reduced attenuation by **40%**. Reduction of electric and magnetic fields are reduced by **30%**.



Preliminary studies by C. Serpico



# CLIC MODULE – EXPERIMENTAL PROGRAM

	ACTIVITIES	AREA
1	General mechanical integration, including vacuum and water cooling - assembly sequences	LAB + CLEAR
2	General alignment, girder and SAS; vibration and environmental studies	LAB + CLEAR
3	Dynamic alignment: mechanical constraints, including vacuum	LAB + CLEAR
4	Thermo-mechanical behaviour of the CLIC K-Module	LAB + Xbox
5	Validation of RF critical components and general RF power handling of the system	Xbox
6	RF conditioning and operational studies of the CLIC K-Unit (RF power source and Module)	Xbox
7	Experimental program with beam in the CLEAR tunnel	CLEAR



# CLIC MODULE – SHORT TERM PROGRAM

## **1 General mechanical integration, including vacuum and water cooling - assembly sequences**

Development of a technical specification for production

Fiducialisation "à la PACMAN"

Procedures for assembly and installation

## **2 General alignment, girder and SAS; vibration and environmental studies**

Absolute alignment of components, including longitudinal

Transport test

Test alignment in a real accelerator environment

Perform alignment at different ambient temperatures, from 20 °C

Vibrational modes characterization

## **3 Dynamic alignment: mechanical constraints, including vacuum**

Experience dynamic alignment with waveguide constraints, vacuum forces and thermal stresses



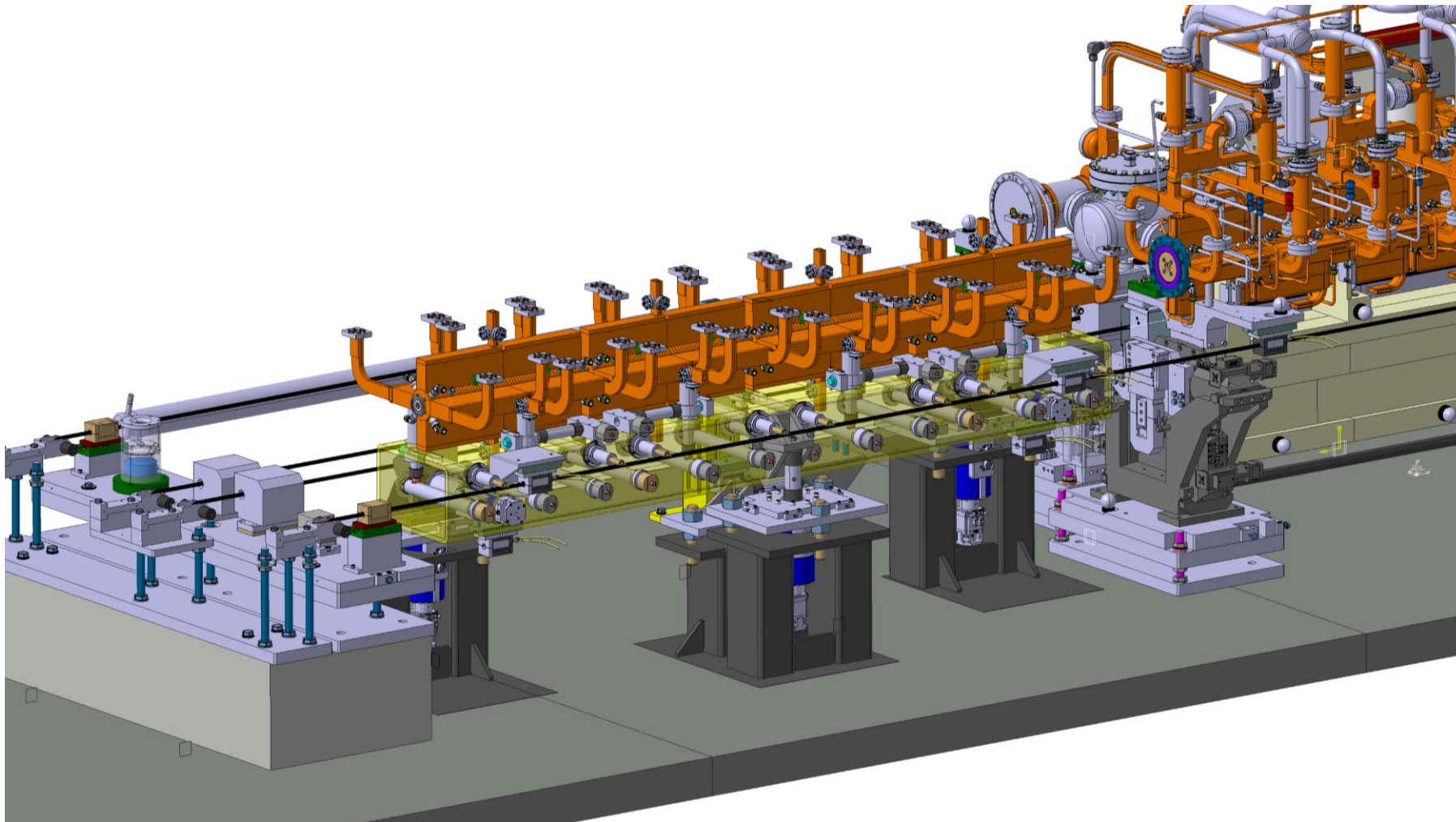


## CLIC MODULE – SHORT TERM PROGRAM

- SAS design and integration into the Module;
- Validation of the girder and adjustable support prototypes;
- Choice and integration of the girder movers;
- Integration study of the new girder into the LAB;
- Reorganization of the LAB area and environment.



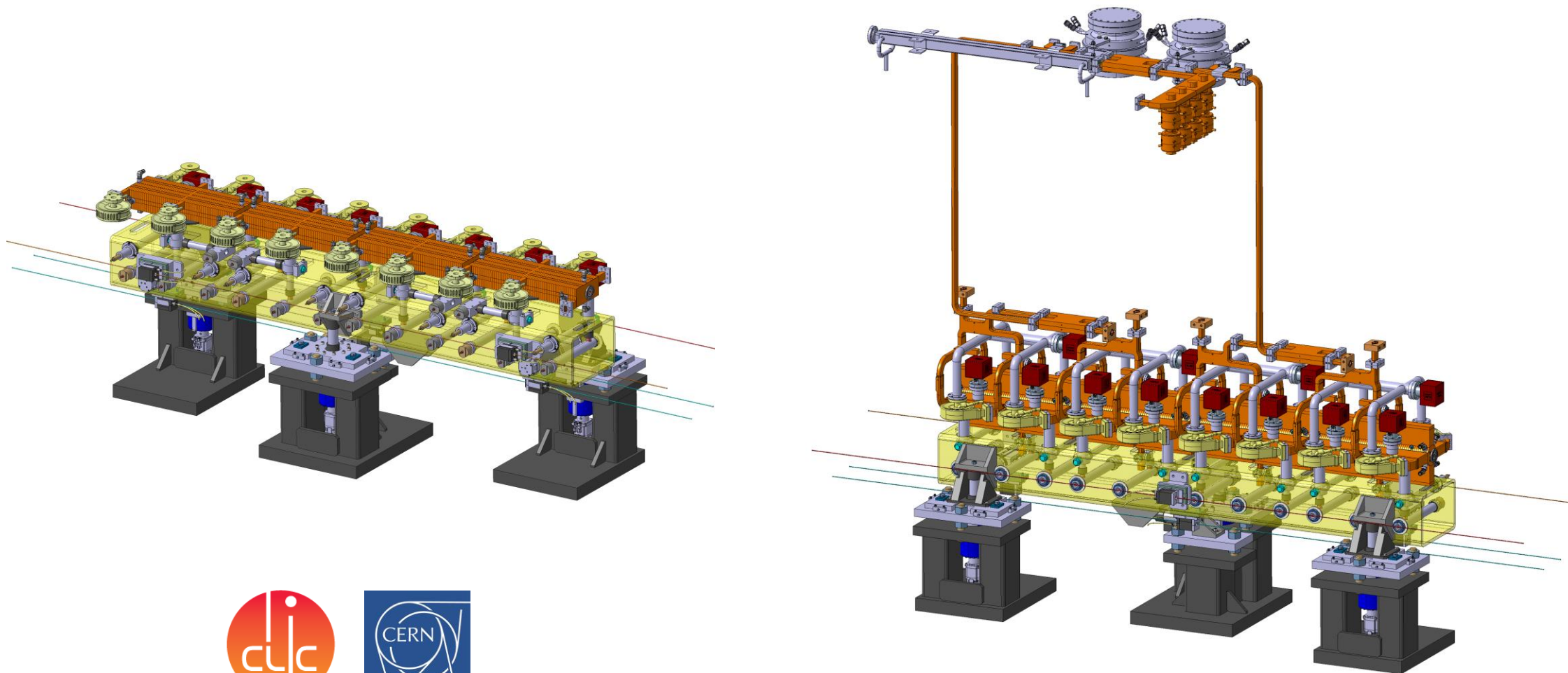
## CLIC MODULE – SHORT TERM PROGRAM



Integration in the  
LAB environment

Meet the Survey  
team on 3.02 to  
detail the 2021  
program.

# CLIC MODULE – SHORT TERM PROGRAM



## CLIC MODULE – SHORT TERM PROGRAM

- SAS design and integration into the Module;
- Validation of the girder and adjustable support prototypes;
- Choice and integration of the girder movers;
- Integration study of the new girder into the LAB;
- Reorganization of the LAB area and environment.

