

EuPRAXIA@SPARC_LAB: Machine Layout

Andrea Ghigo

EuPRAXIA Building rendering (front view)

 PROGETTO DEFINITIVO PER LA REALIZZAZIONE DEL NUOVO COMPLESSO EDILIZIO EuSPARC PRESSO I LNF DI FRASCATI											
PROGETTO DEFINITIVO NUOVO COMPLESSO EuSPARC											
Descrizione del progetto: Progettazione Definitiva e Coordinamento della Sicurezza in fase di progettazione inerente il nuovo complesso edilizio denominato Eusparc atto ad ospitare la nuova macchina acceleratrice dei Laboratori Nazionali di Frascati INFN.											
 <small>Istituto Nazionale di Fisica Nucleare Laboratori Nazionali di Frascati</small> R.U.P.: Ing. Simona Incremona	PROGETTAZIONE:  Responsabile di progetto: Ing. Fabio Inzani Progettista opere architettoniche: Arch. Stefano Carera Progettista opere impiantistiche: Ing. Stefano Bonfante Coordinatore della Sicurezza in fase di progettazione: Ing. Luca Giordo										
Disciplina di progetto: PROGETTO ARCHITETTONICO Elaborato: Viste renderizzate 01AR.P1.RND.300											
<table border="1"> <thead> <tr> <th>REV. N° 0</th> <th>DATA REV.</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> </tbody> </table>	REV. N° 0	DATA REV.									Data: 15/01/2021
REV. N° 0	DATA REV.										



See Ugo Rotundo presentation

● Adjacent parcel of land has been acquired



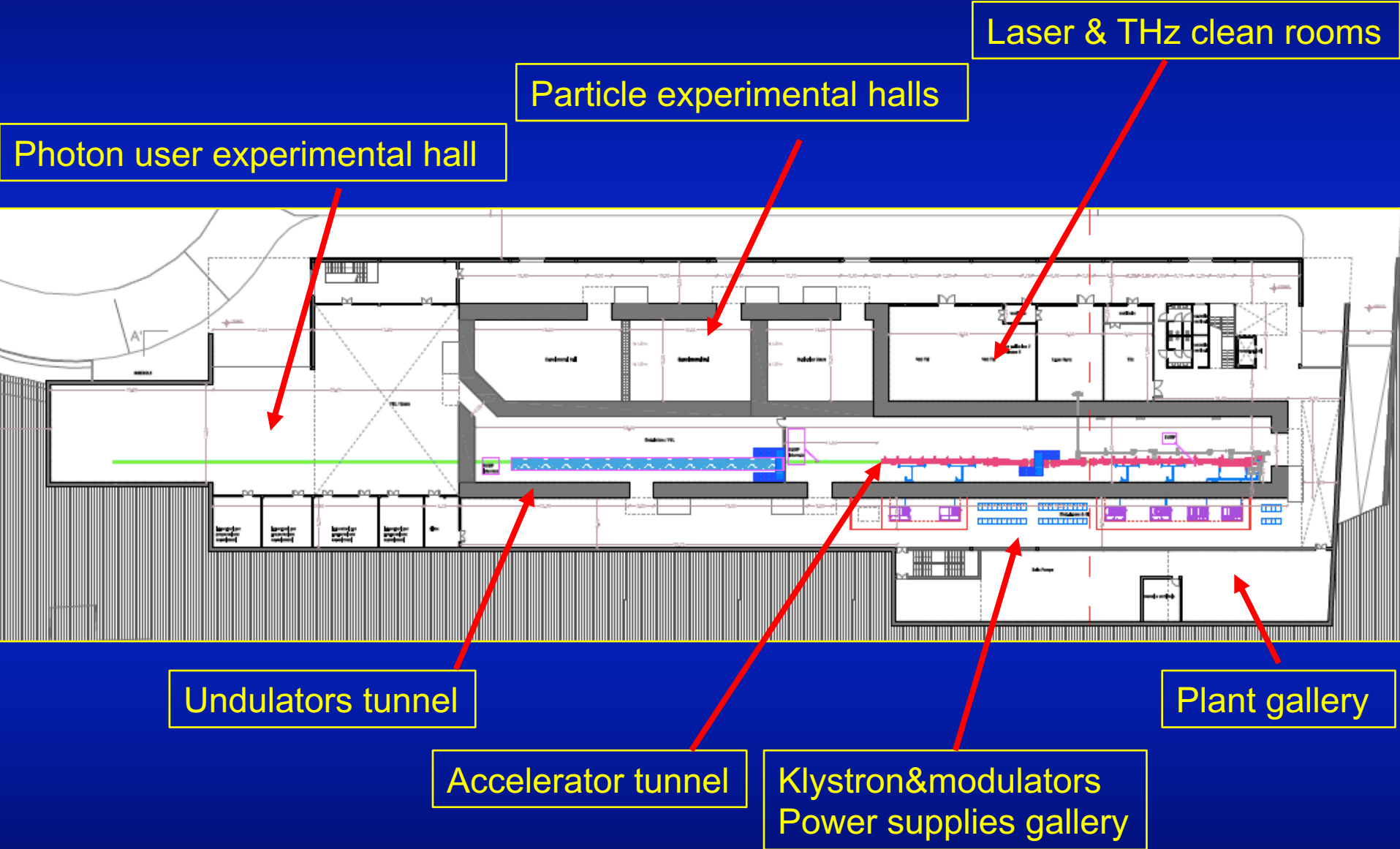
Area : 4.900 m²
Volume: 49.000 m³

Space available for a more functional working site

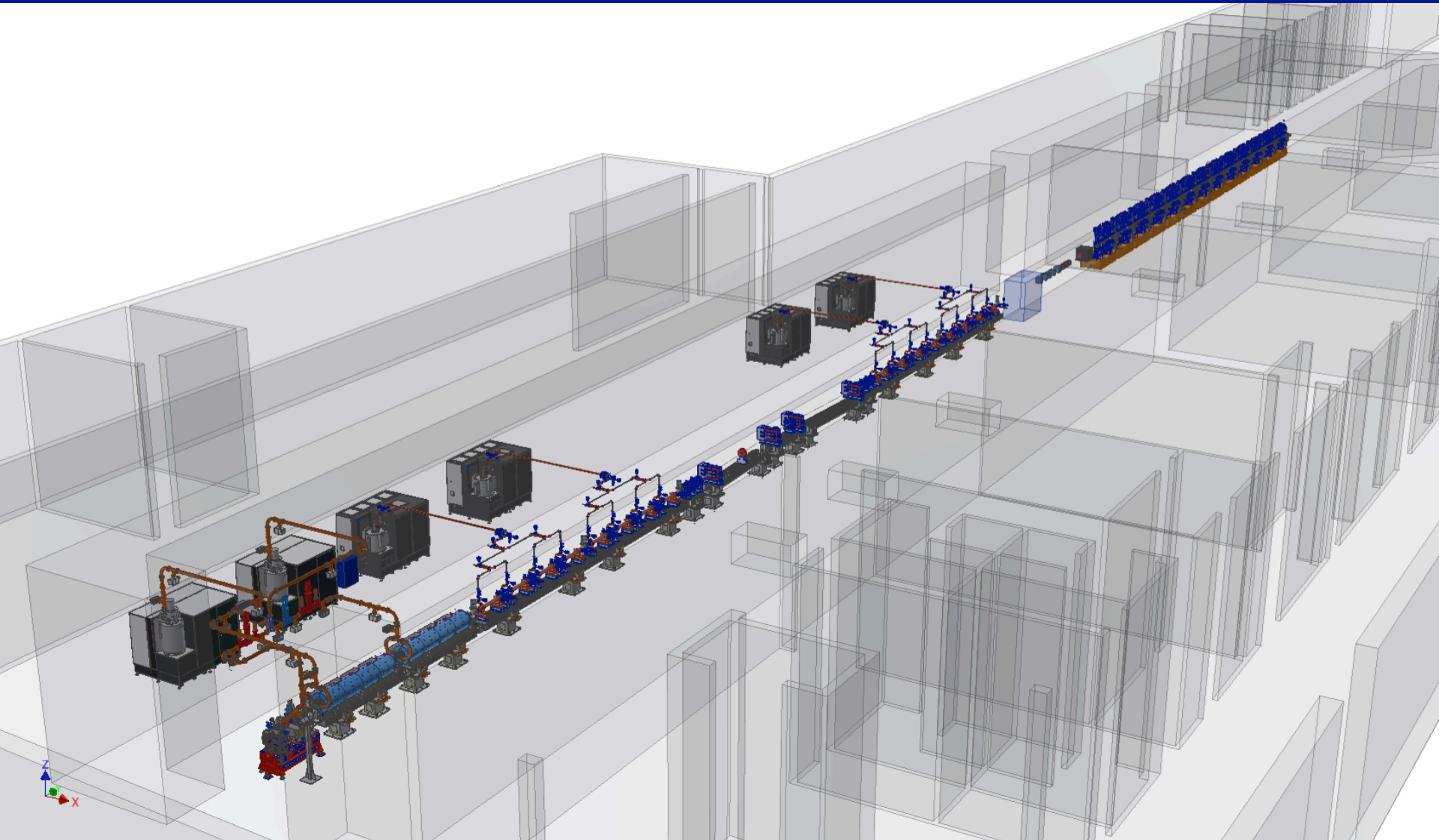
EuPRAXIA Site @ LNF



The building layout (ground floor)

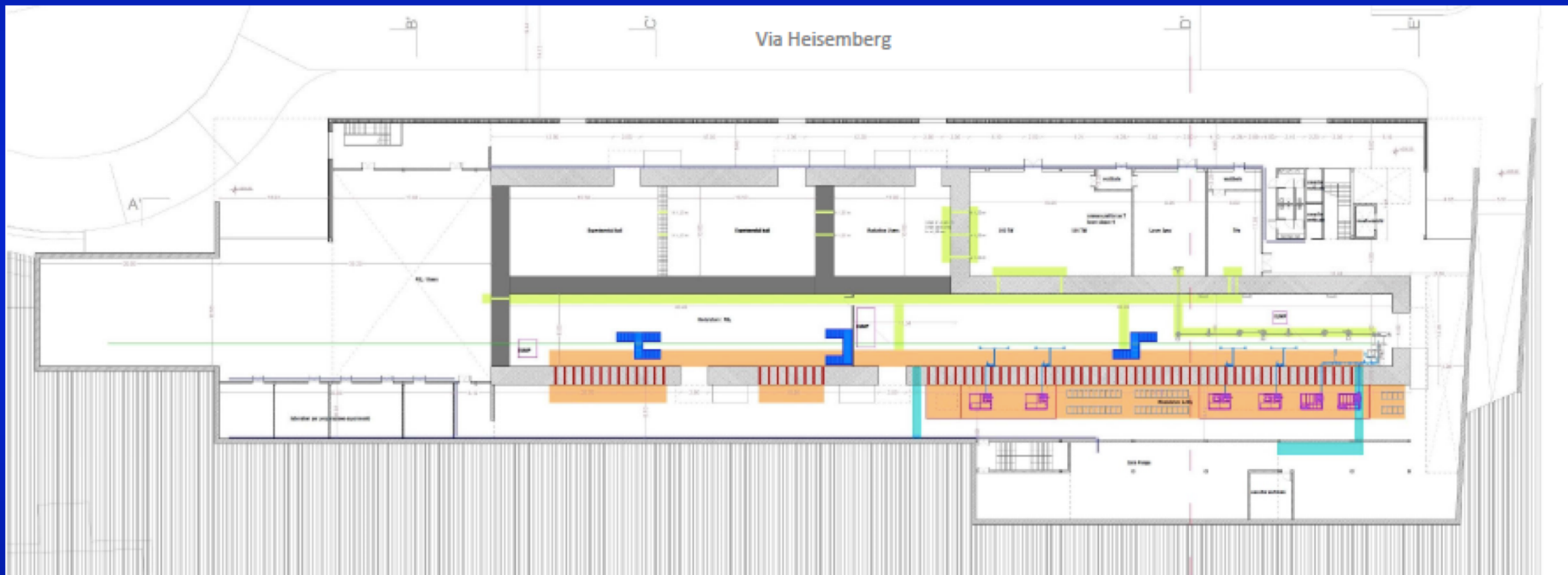


Linac & undulators 3D layout



Plants distribution

The design of the electrical distribution, air conditioning, temperature stabilization, clean rooms, main water cooling systems has been prepared



Laser shaft



holes for cables

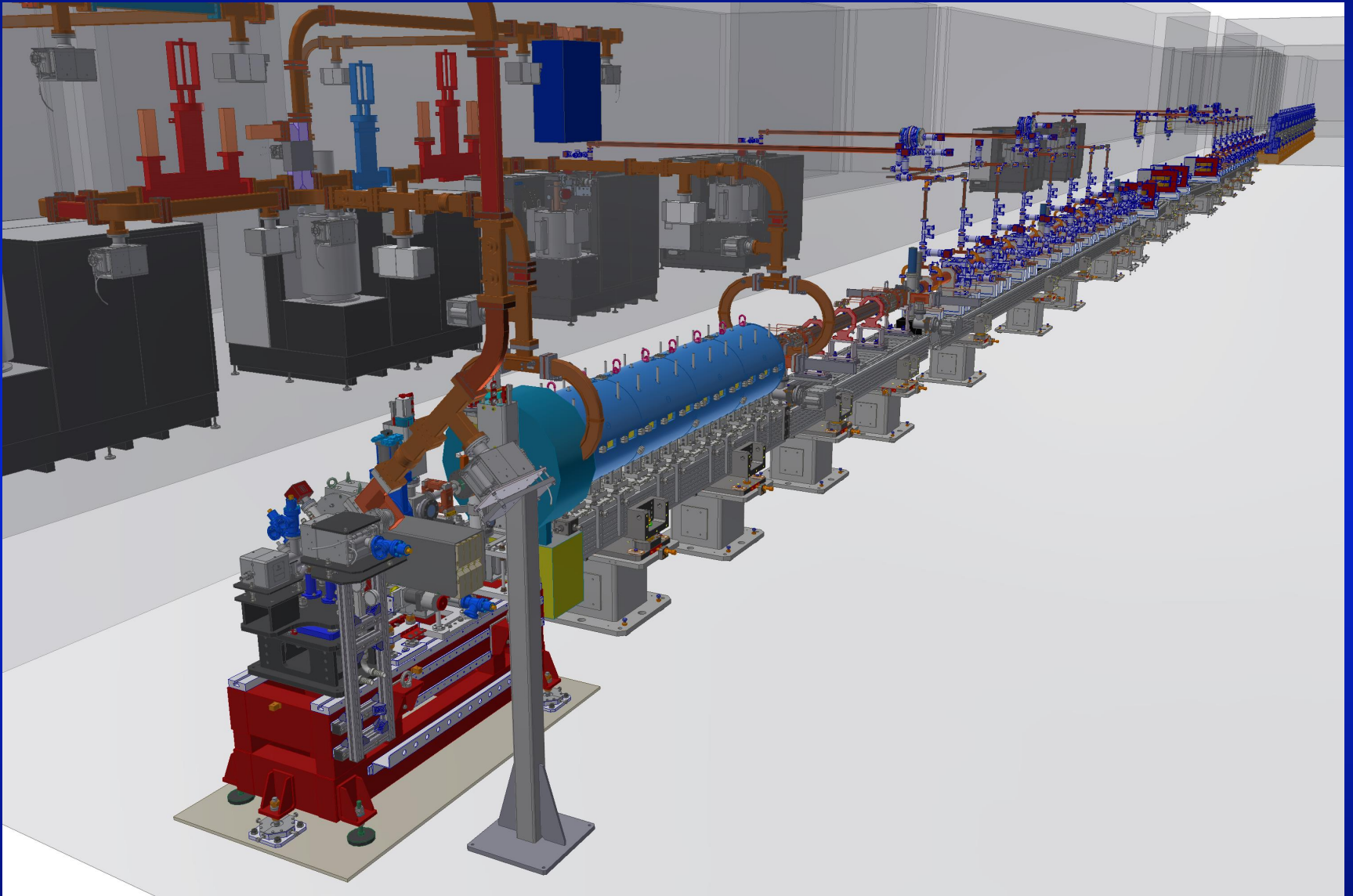


Cavity for cooling tubes

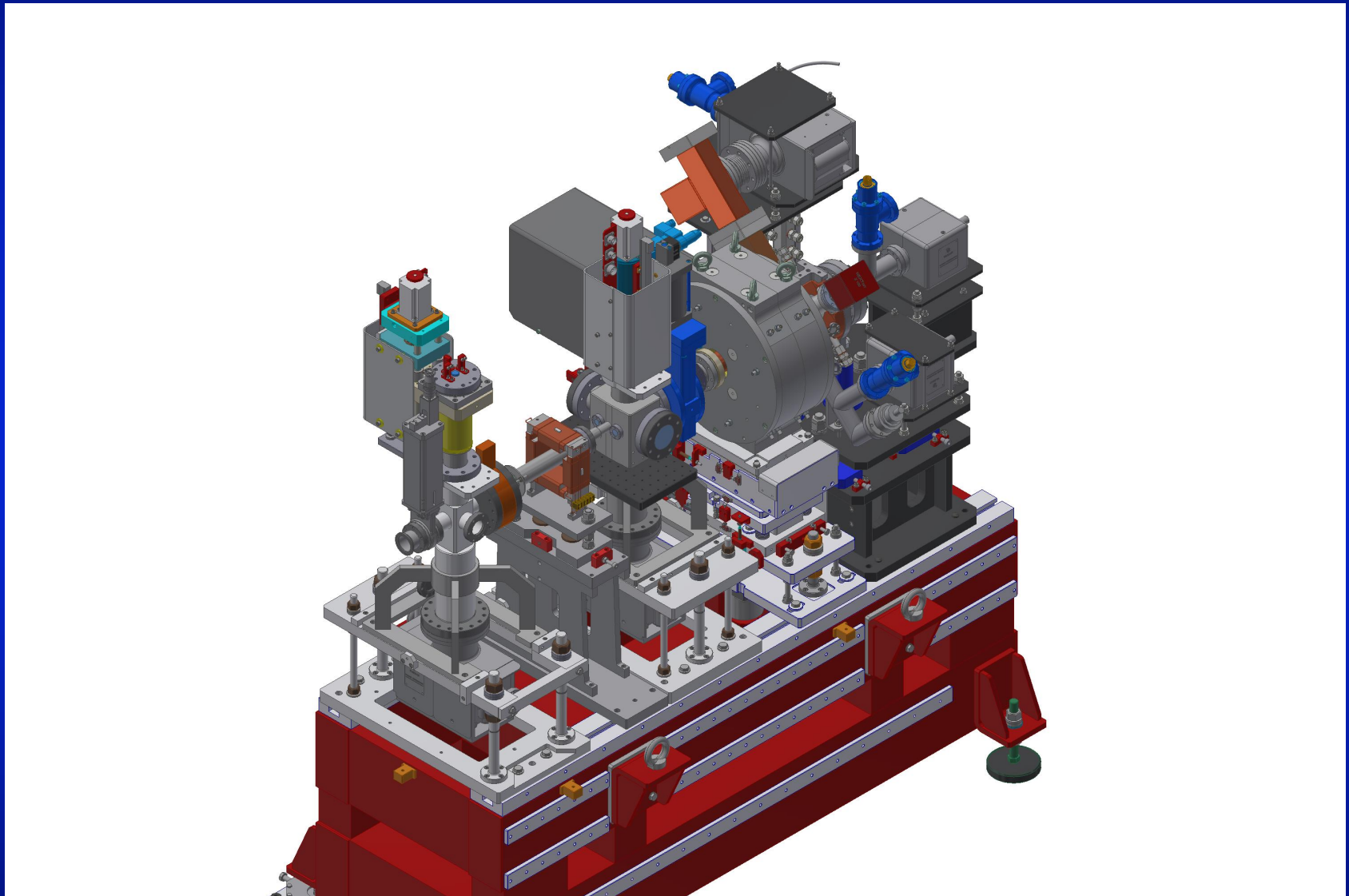


Water collection area

EuPRAXIA Linac



New SPARC Gun



New SPARC Gun Components

Cathode

RF Cavities

Waveguide

Solenoid

Valve

Laser ports

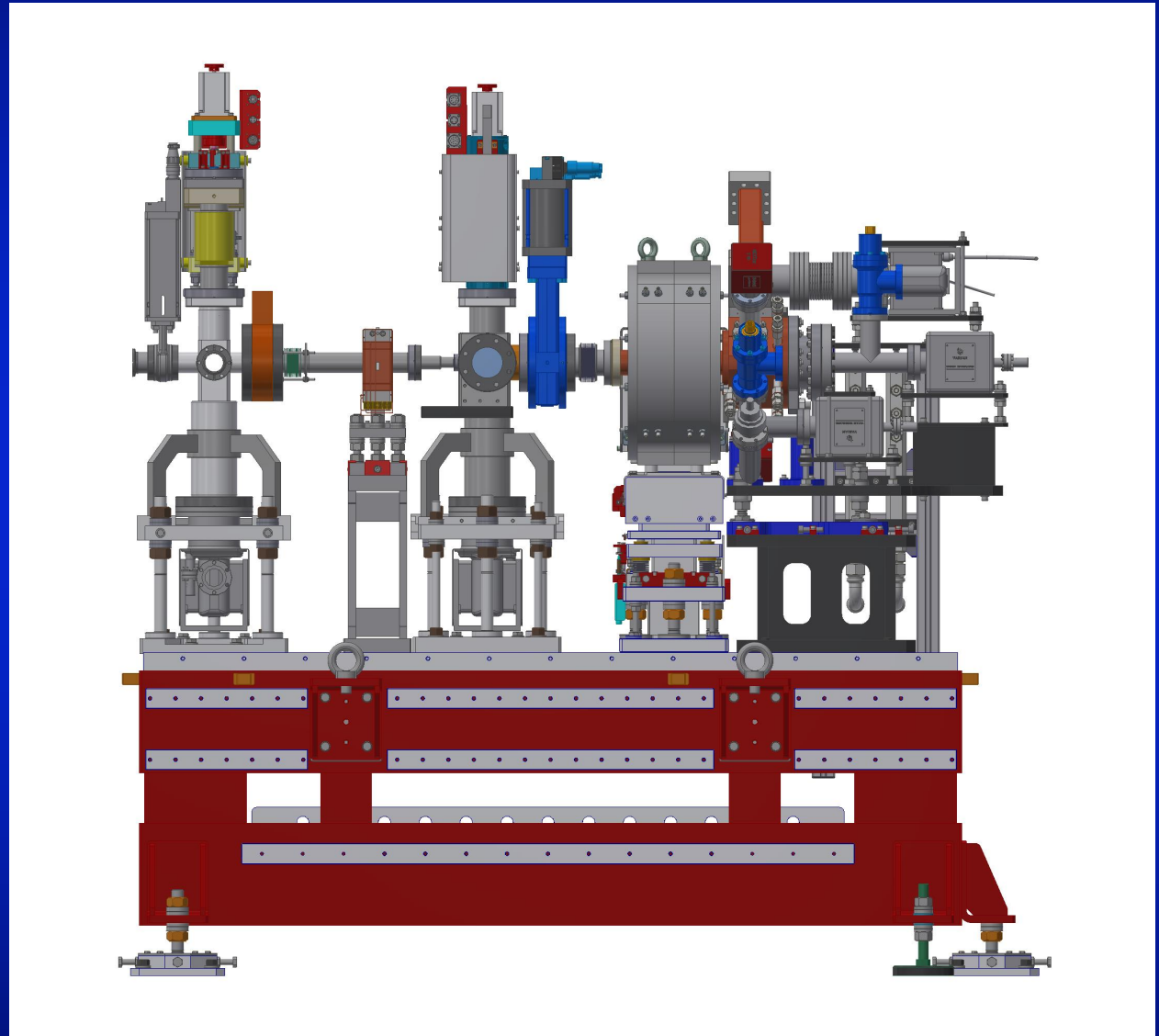
Corrector

Current transformer

Farady cup

Flag

Fast valve



RF photoinjector

Photoinjector:

RF Gun

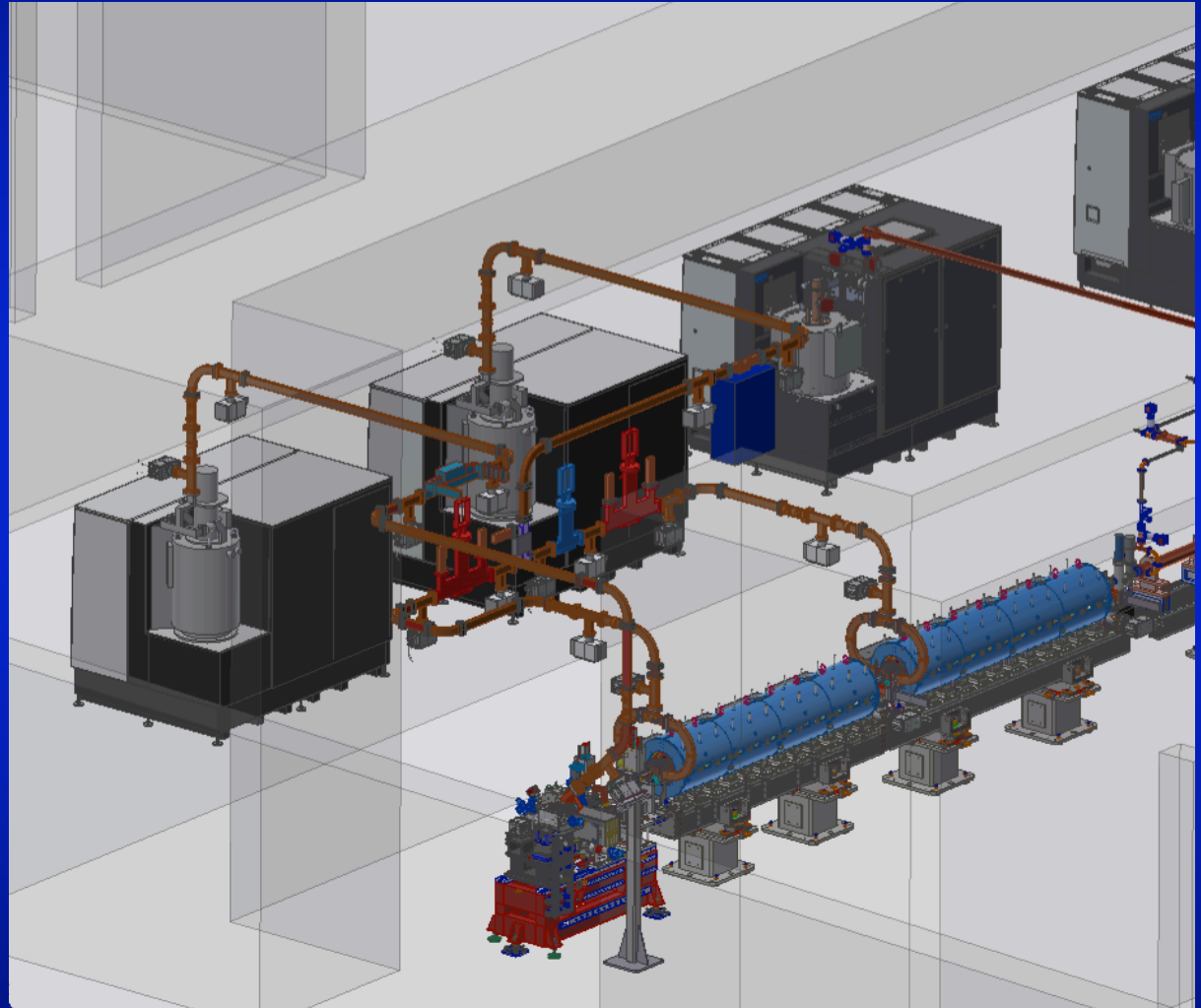
Two 3m S-Band RF accelerating structures

Two S-Band Klystron & modulator power stations.

Solenoids x gun and two accelerating structure

RF pulse compressor (SLED)

Laser Heater module



X-band Linear accelerator

Linac:

18 X-band
accelerating
structures 0.9 m
long

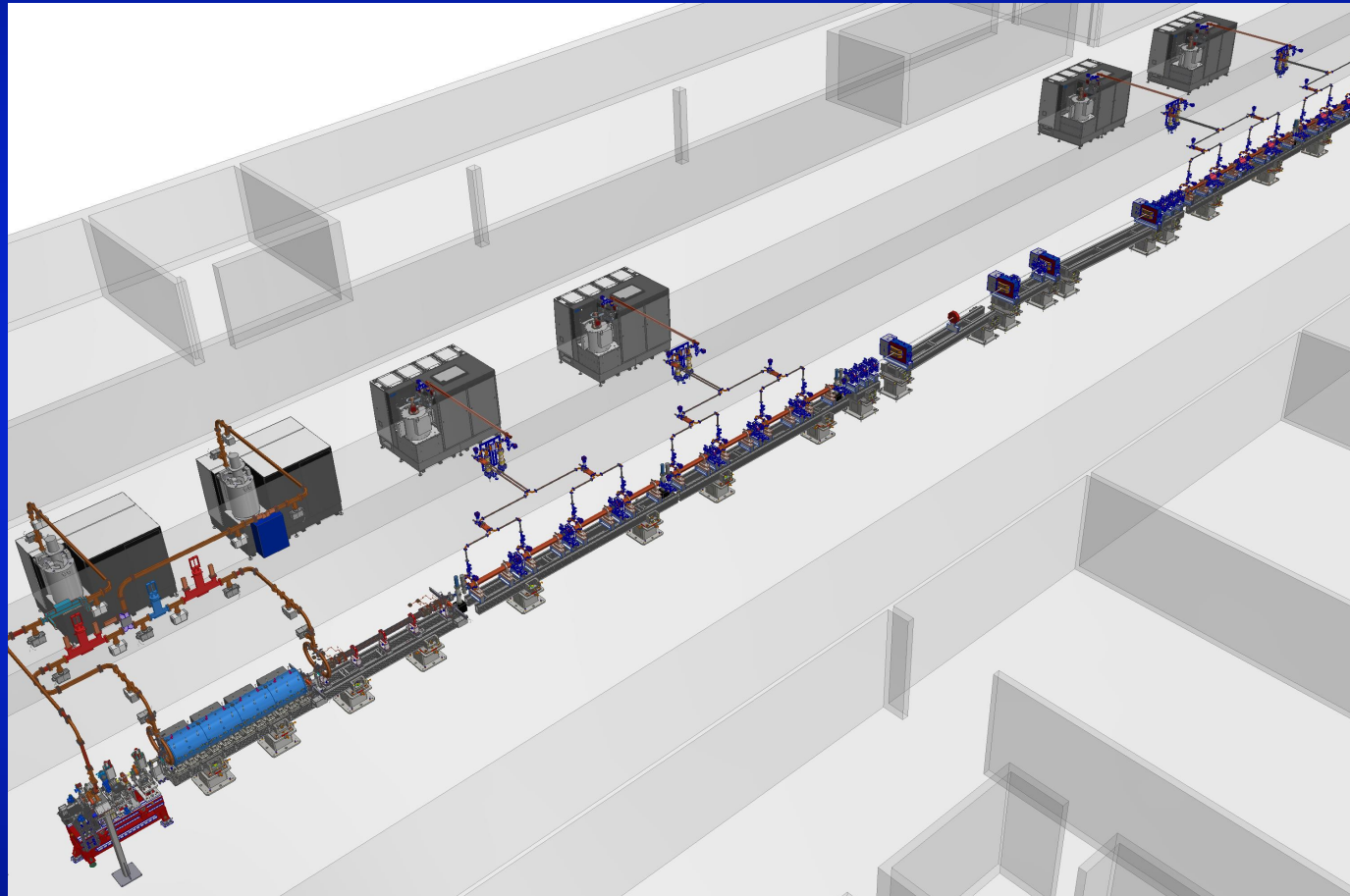
6 X-Band Klystron
and modulator
power stations.

2 RF deflectors

**6 RF pulse
compressors (BOC)**

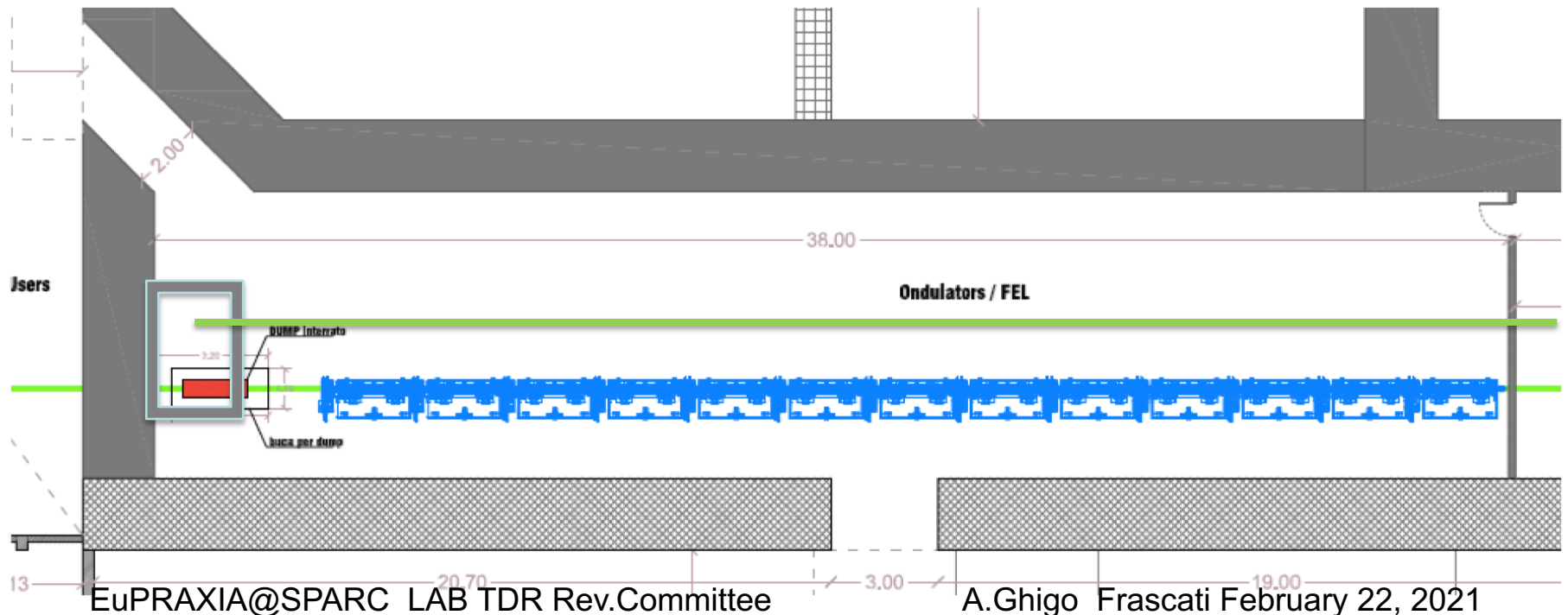
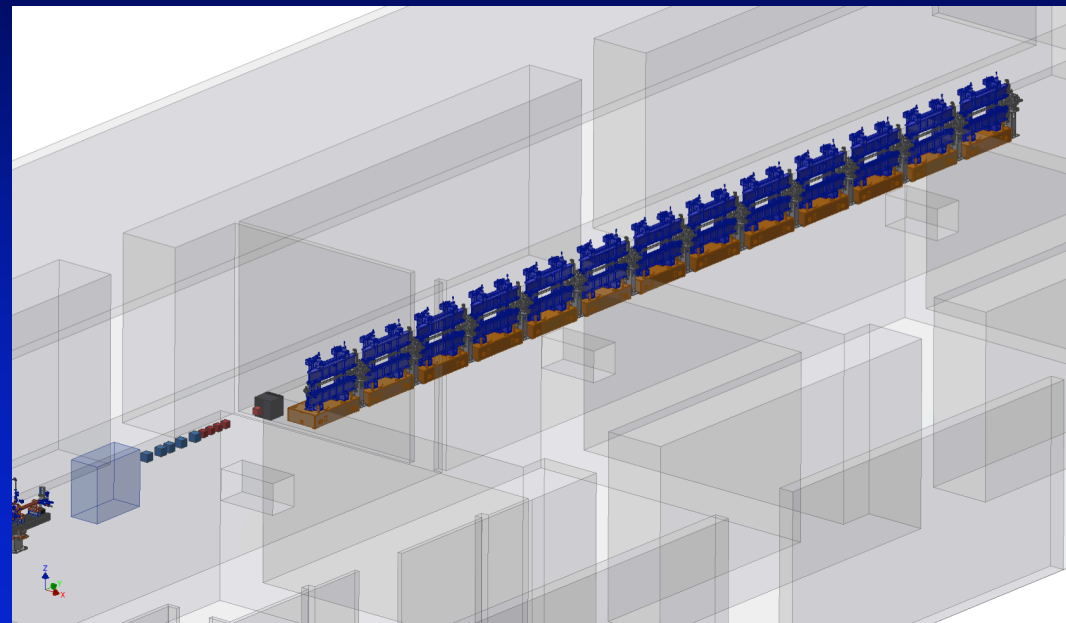
**Bunch compressor
Magnetic chicane**

**4 Dipoles
+ quads**



Undulators & beam dump studies

- Permanent magnet Undulators & Diagnostics
- 30 m total length
- undulator module 2.3 m long
- Combination of SC and NC undulator is under study

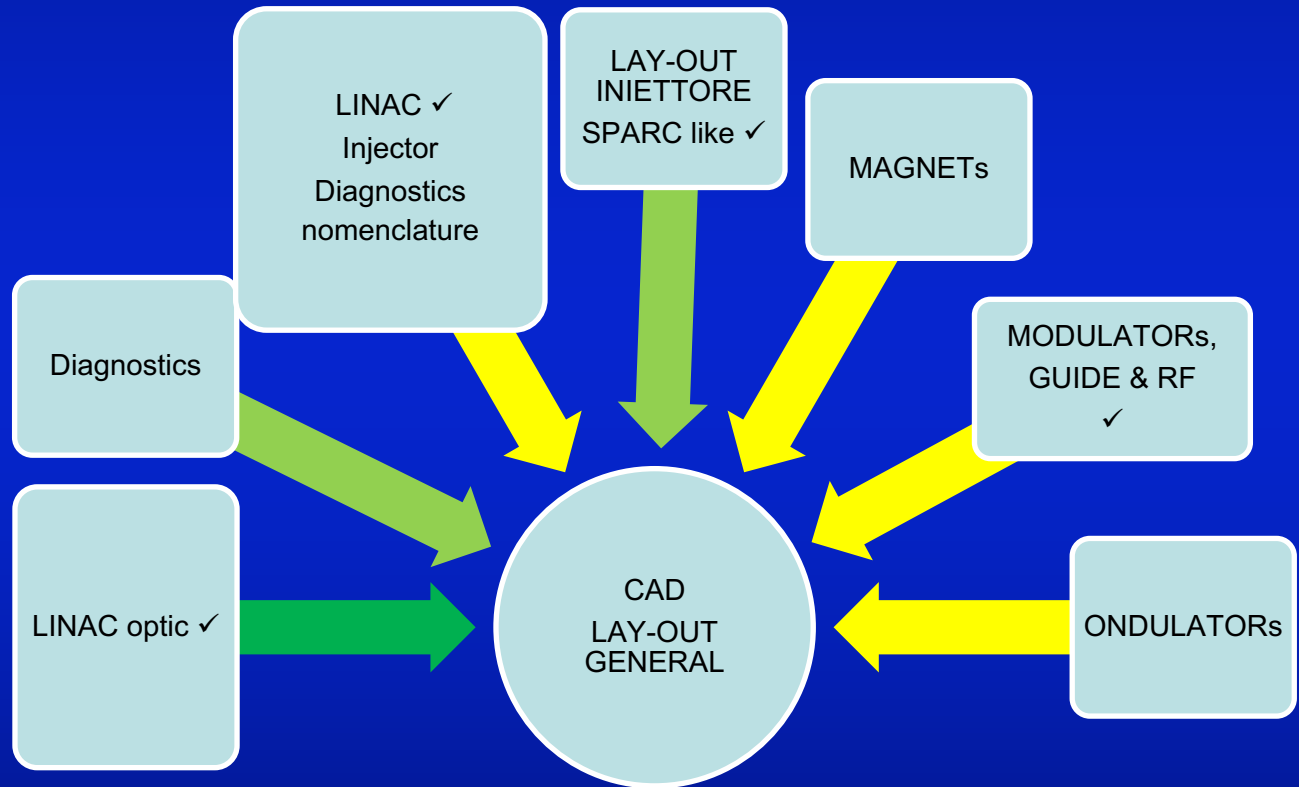


SUMMARY OF THE INTEGRATION STATE: New tools

 To do

 done

 ready

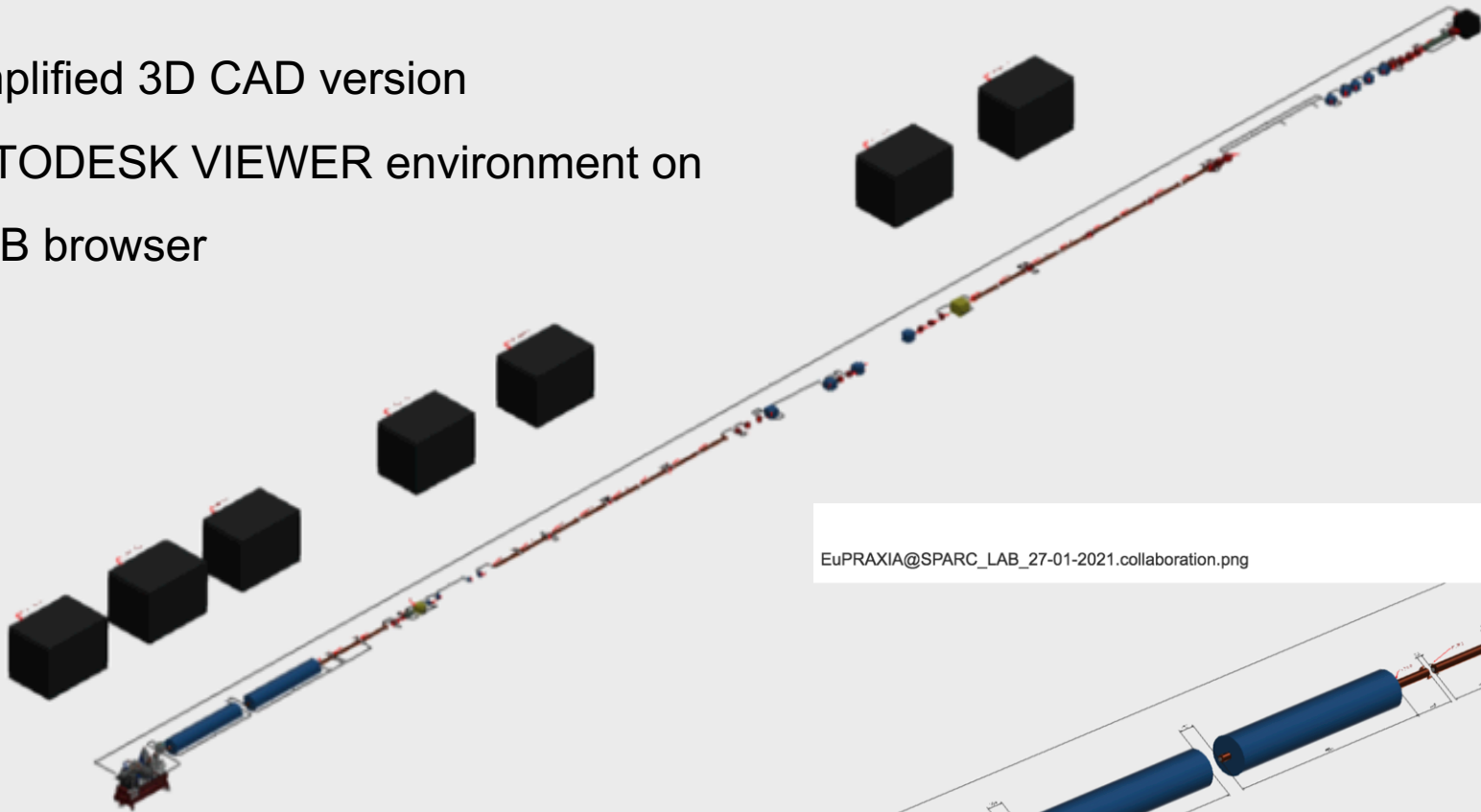


Mechanical implementation tool

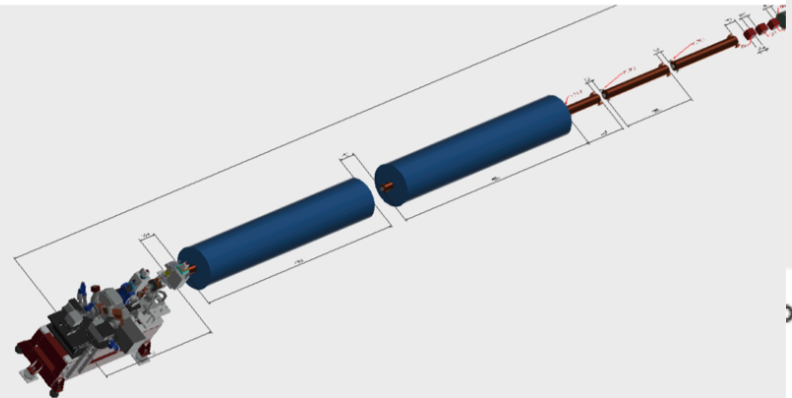
Simplified 3D CAD version


AUTODESK VIEWER environment on

WEB browser



EuPRAXIA@SPARC_LAB_27-01-2021.collaboration.png



 AUTODESK VIEWER

L. PELLEGRINO – E. DI PASQUALE

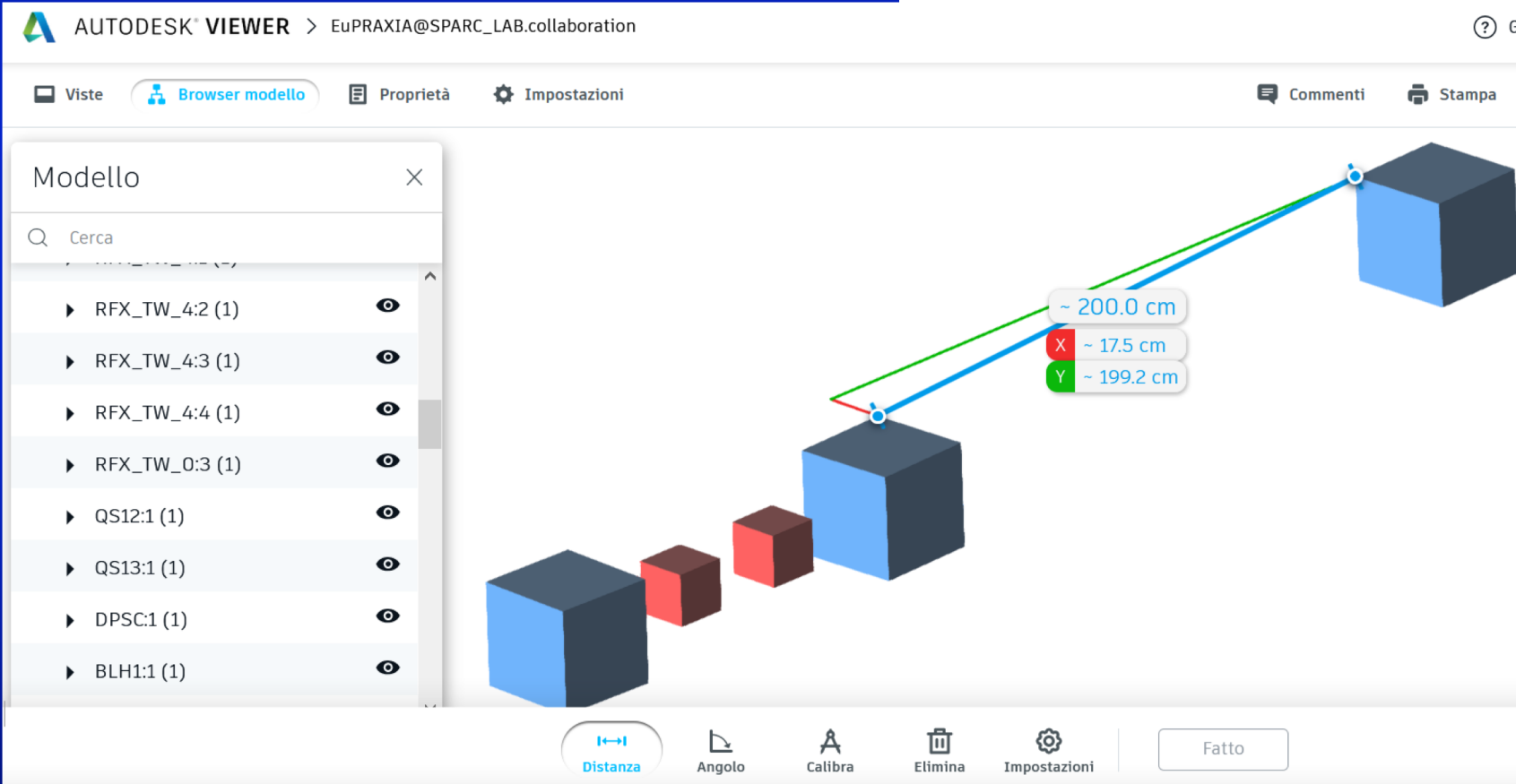
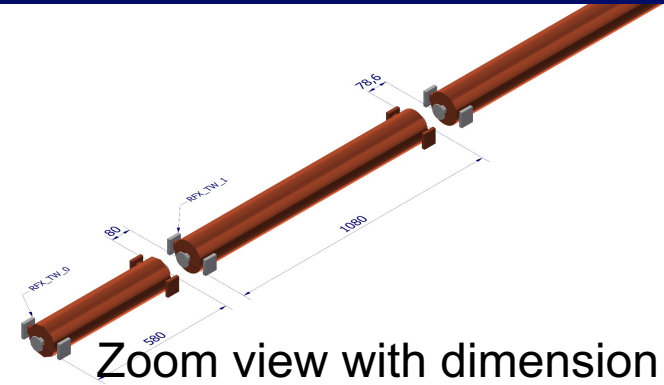
 AUTODESK VIEWER

 AUTODESK

Lay-out setting

- positions and orientation of elements from file `200pC_1GeV_X_90cm_update_short_LH_4b_up_check_new_Oct_20_flr.xlsx`
- **dipoles and quadrupoles** = cubes with side equal to the magnetic length
- **RF sections** = full size sketches
- A lay-out definition meeting is being planned: find the status quo of the layout (visible on web browser) at the link <https://autode.sk/2XRyIQV>
- the updated link is available for collaboration on TEAMS

Possible to take measurements, identify components, etc.



New Lay-out setting

- When available, the 3D CADs will gradually replace the cubes.
- The same general assembly will always be available also in "lightened" view to be able to interact quickly on positions and new components.
- REASONABLE IMMEDIATELY: insert the injector in the "new SPARC-like" status.
- EASY NOW: integration of nomenclature from WBS and application to the automatic numbering of drawings

CAD lay-out iniettore-LINAC (ristretta)

Chat | Dettagli | Assistente Pianificazione

Annulla riunione | Fuso orario: (UTC+01:00) Amsterdam, Berlino, Berna, Roma, Stoccolma, Vienna | Opzioni riunione

DA David Alessi (Provisore) | AG Andrea Ghign (Provisore) | AF Antonio Falone (Provisore) | EC Enrica Chadron (Provisore) | AC Alessandro Cianchi (Provisore) | FC Fara Ciotta (Disponibile)

AS Angelo Stella (Disponibile) | CV Cristina Vaccarezza (Scienze) | LS Luca Sabbatini (Provisore) | EP Enrico Di Pasquale (Provisore)

Facoltativi: A mafione7@gmail.com | MG Galimberti, Marco (STFC_RAL/CLF) | AC Alessandro Cianchi (Scienze) | AS Angelo Stella (Scienze)

28 gen 2021 | 14:30 → 28 gen 2021 | 16:30 | 2 h | Tutto il giorno

Confermati: Nessun suggerimento disponibile.

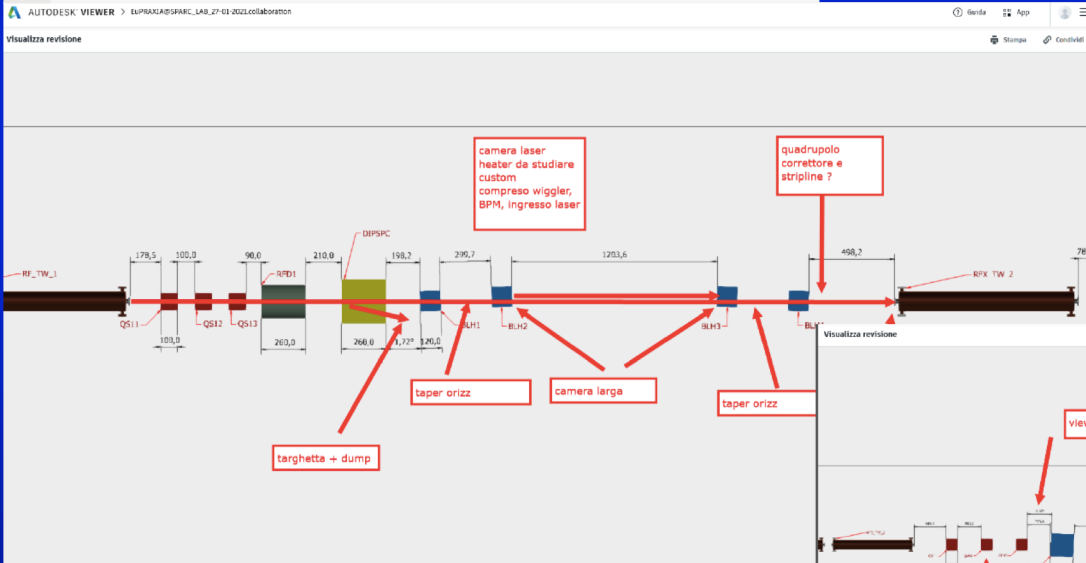
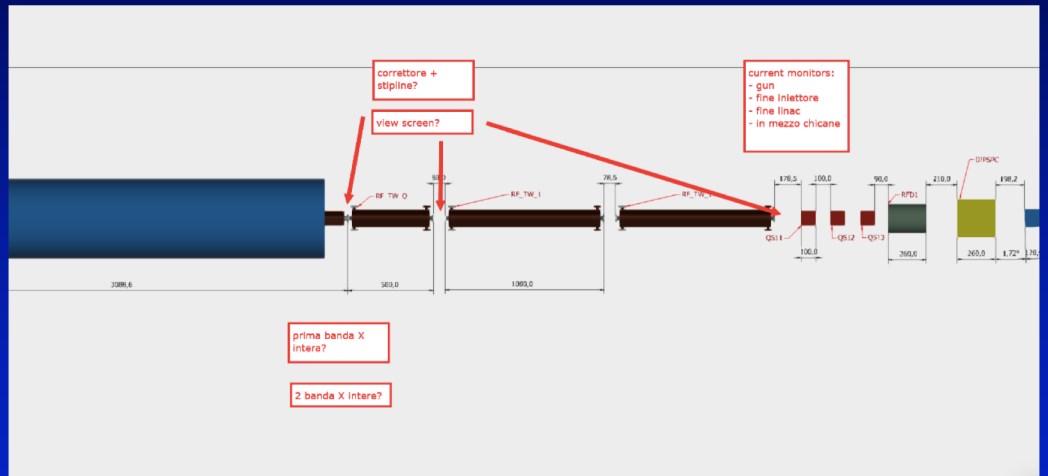
Non si ripete

Aggiungi posizione

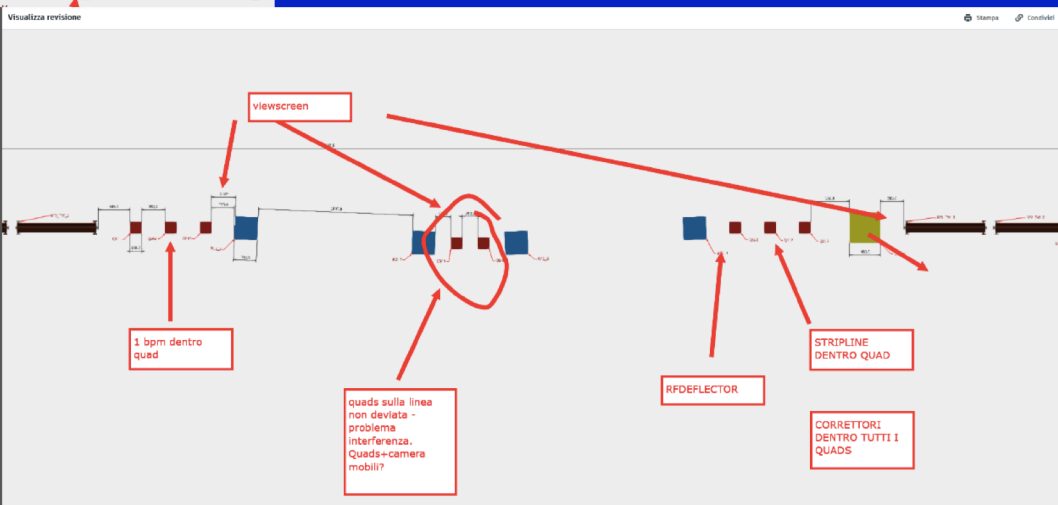
Paragrafo | Paragrafo | Paragrafo

AGENDA

1. impostazione del layout CAD
2. presentazione del tool di visualizzazione del CAD su web browser
3. Spazio tra la seconda sezione in banda C e la prima in banda X.
4. diagnostica (o altro) all'interno dei moduli RF (4 sezioni) e tra un modulo e l'altro.
5. altra diagnostica da inserire
6. lunghezza capillare, RF deflector ed altri elementi non ancora definiti.
7. posizione e dimensioni dei dump e relativi cippi.
8. aggiornamento dimensionamento preliminare in gnetel
9. varie ed eventuali



interact quickly with the design team



Layout implementation

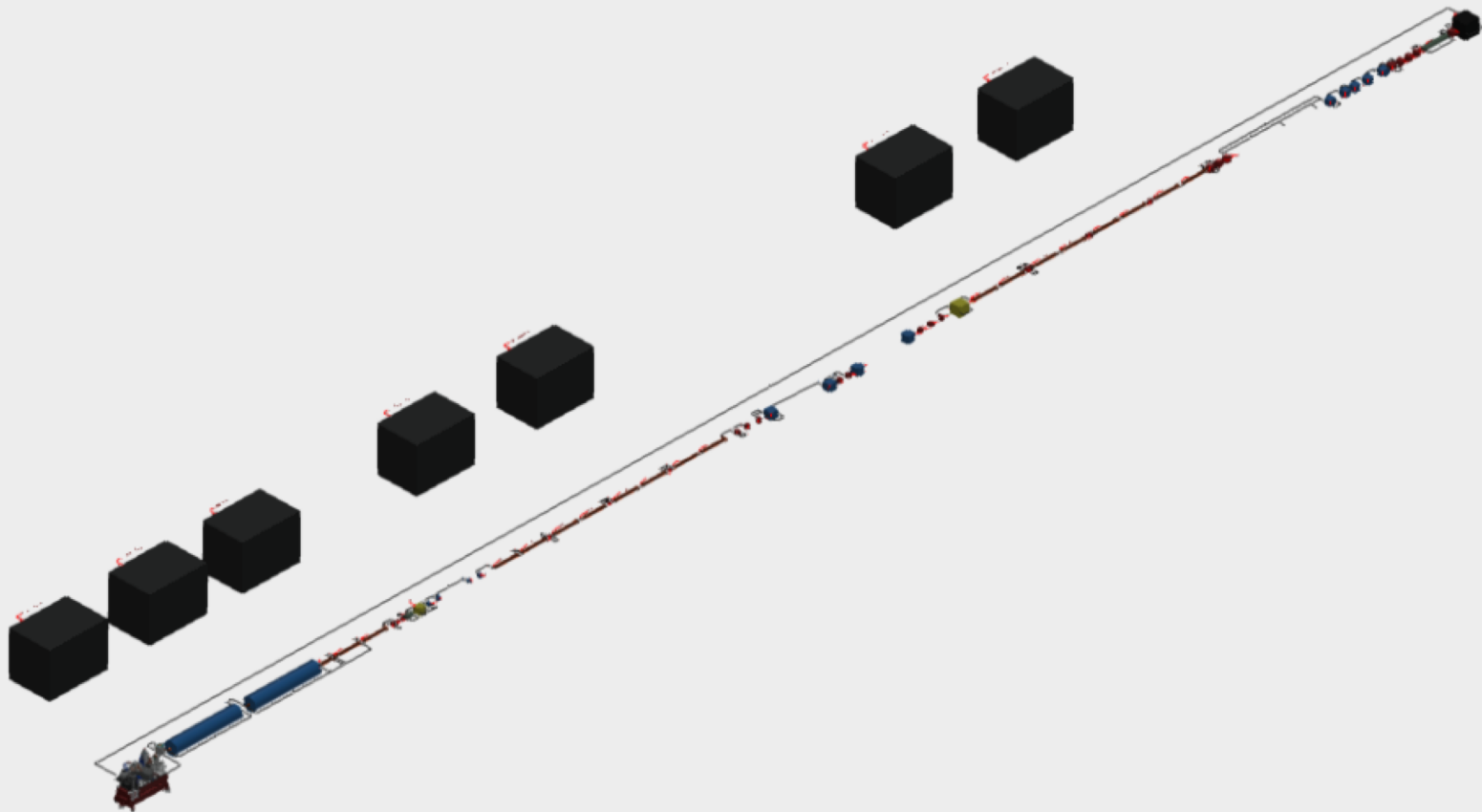
Vacuum chambers are still missing

AUTODESK VIEWER

Basic Diagnostics & Vacuum components have been inserted

AUTODESK VIEWER

AUTODESK





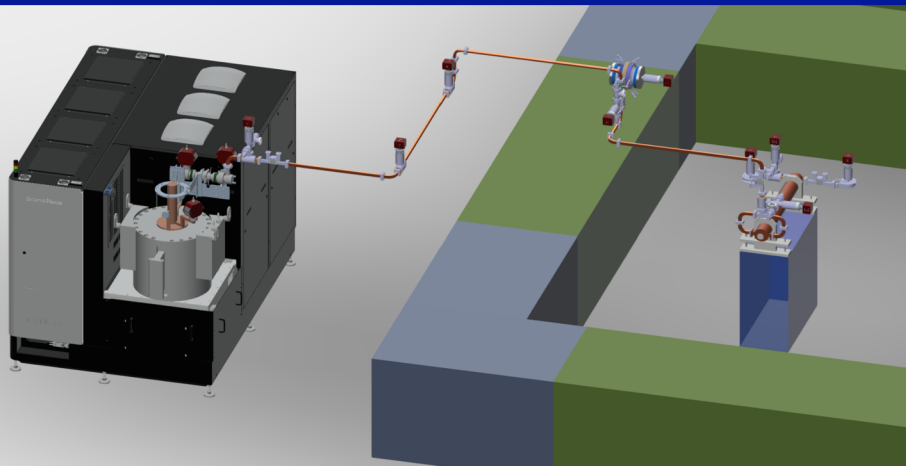
Istituto Nazionale di Fisica Nucleare



Thanks for the attention

R&D Activities

TEX: X-band test stand
EuPraxia/CERN collaboration

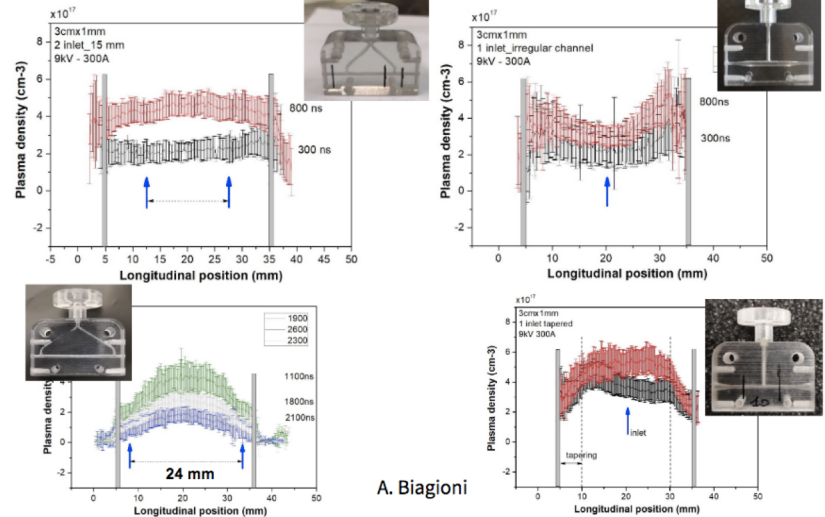


R&D Activities

Cathode-lab



Quantum efficiency measurements
of new emitter material
Cathode test



Plasma-lab

New capillary shapes test
Discharge circuit test

