EUROPEAN
PLASMA RESEARCH
ACCELERATOR WITH
EXCELLENCE IN
APPLICATIONS

EuPRAXIA
at SPARC_LAB

EuPRAXIA@SPARC_LAB
Machine Layout

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Outlook

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- Functional description of the building
- Accelerator design criteria
- Layout of the accelerator
- Undulators and electron beam dump
- FEL photons beam lines
- High power laser clean rooms
- Particle experimental Labs
- User area

Machine & undulator 3D Layout

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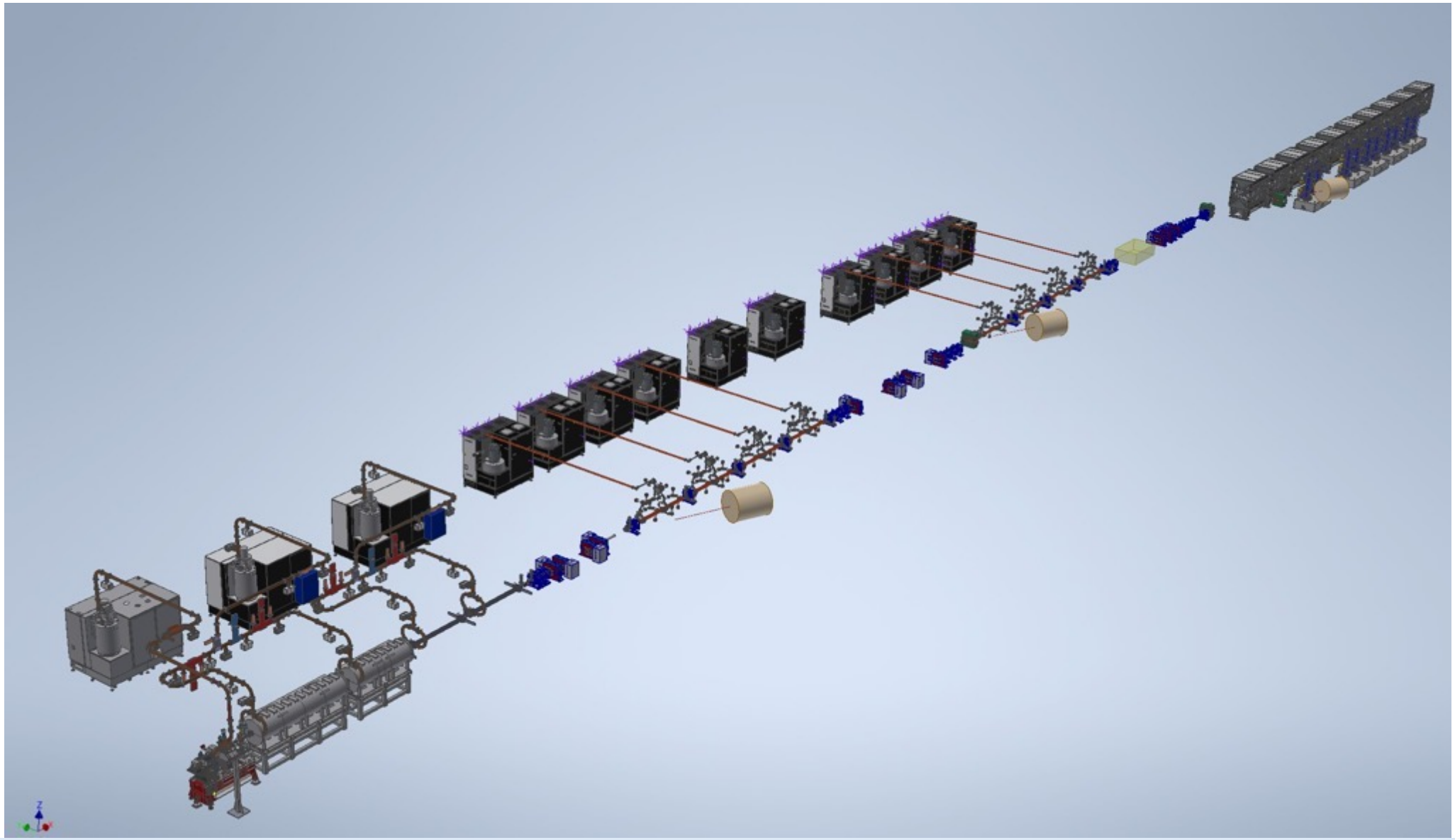

Building areas

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Ground floor

Accelerator Tunnel

Modulator & power supply area

Undulator tunnel

FEL user area

Experimental Areas

Laser Rooms

First floor

Control room

Laser Rack room

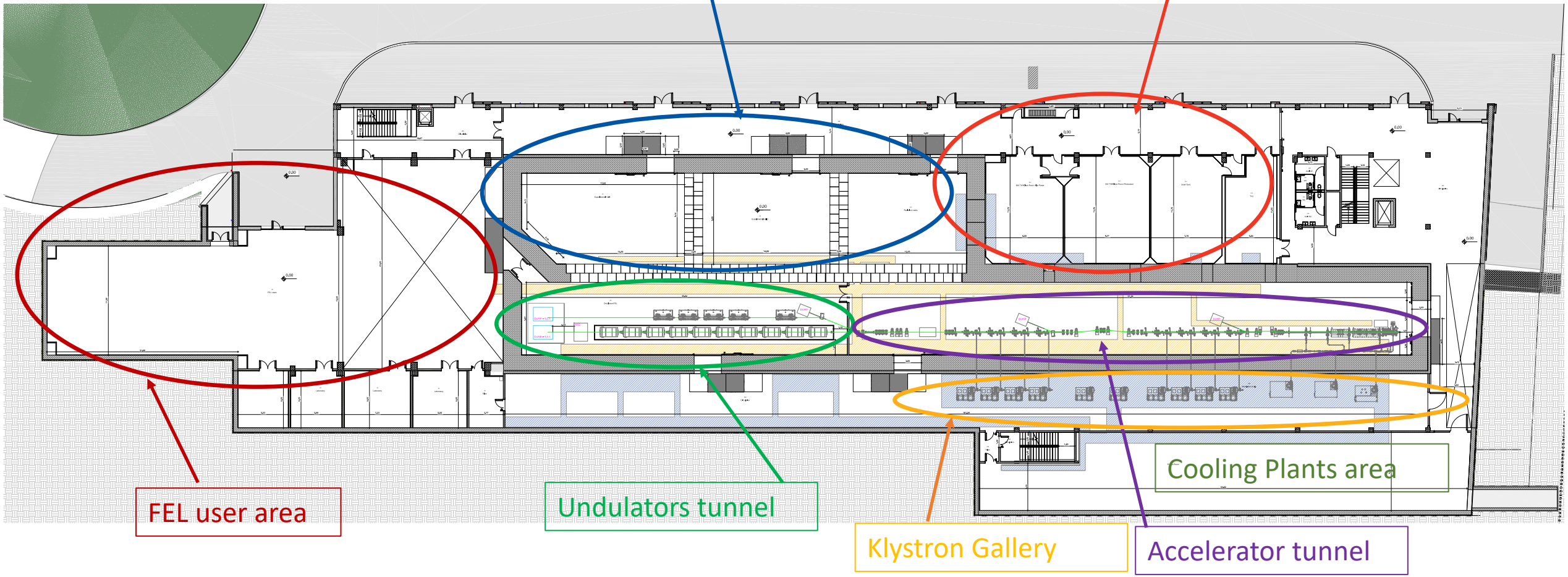
UTA corridors

Users offices & meeting room

Break area

Terrace

Building Functional Layout – Ground floor



cfr Simona Incremona talk

Building Functional Layout – First floor

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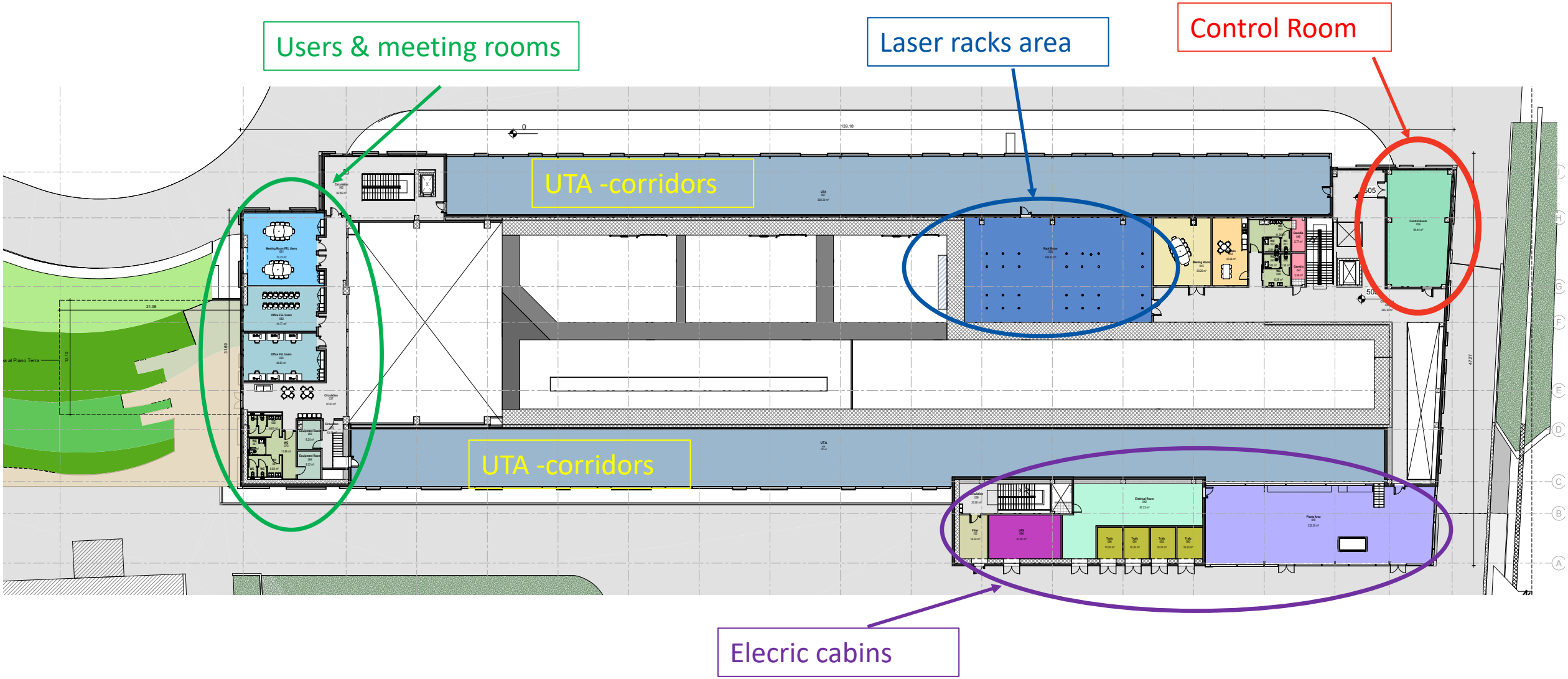

Building Functional Layout – Undulator area

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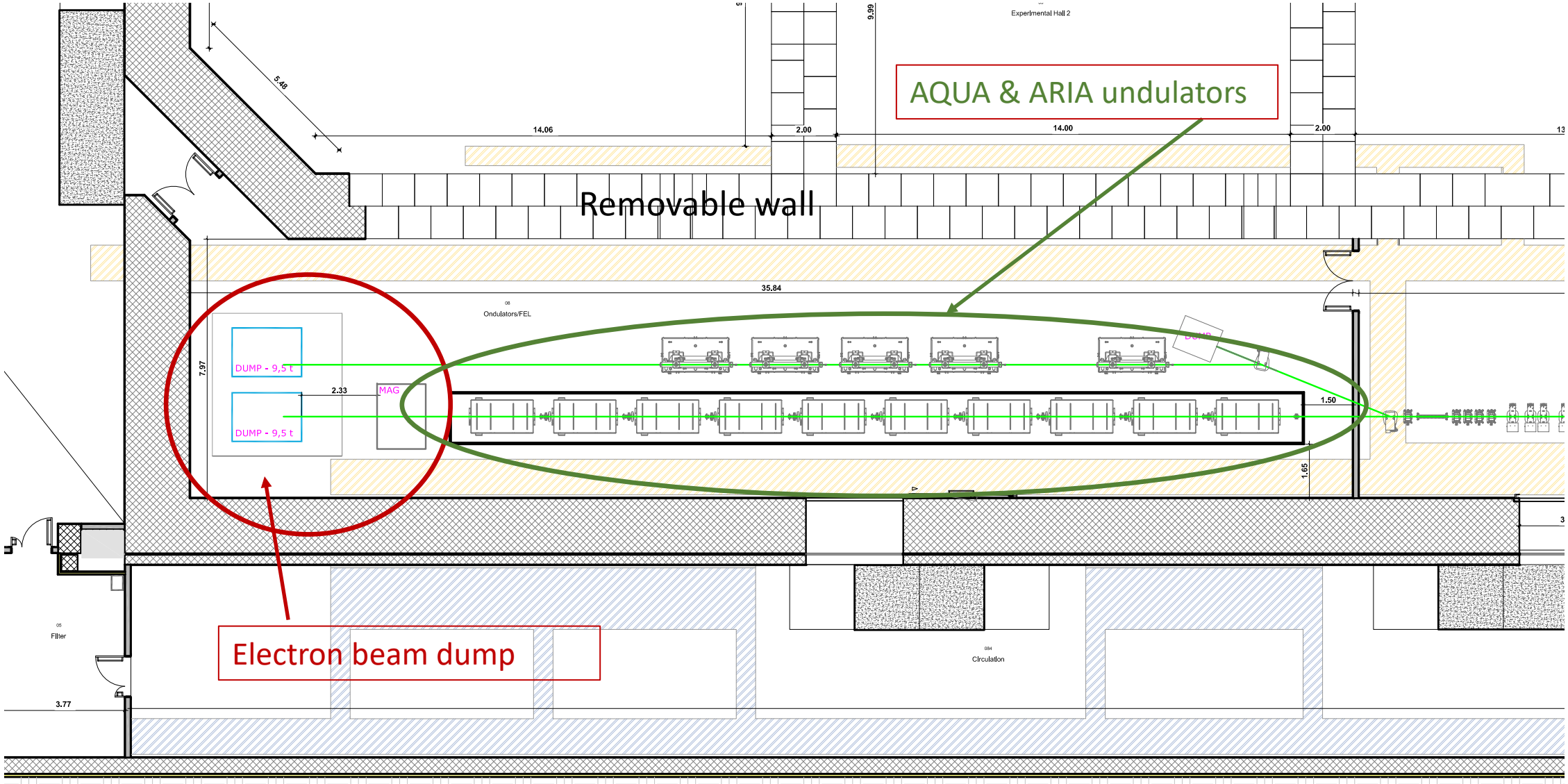

Beam lines & user area schematic

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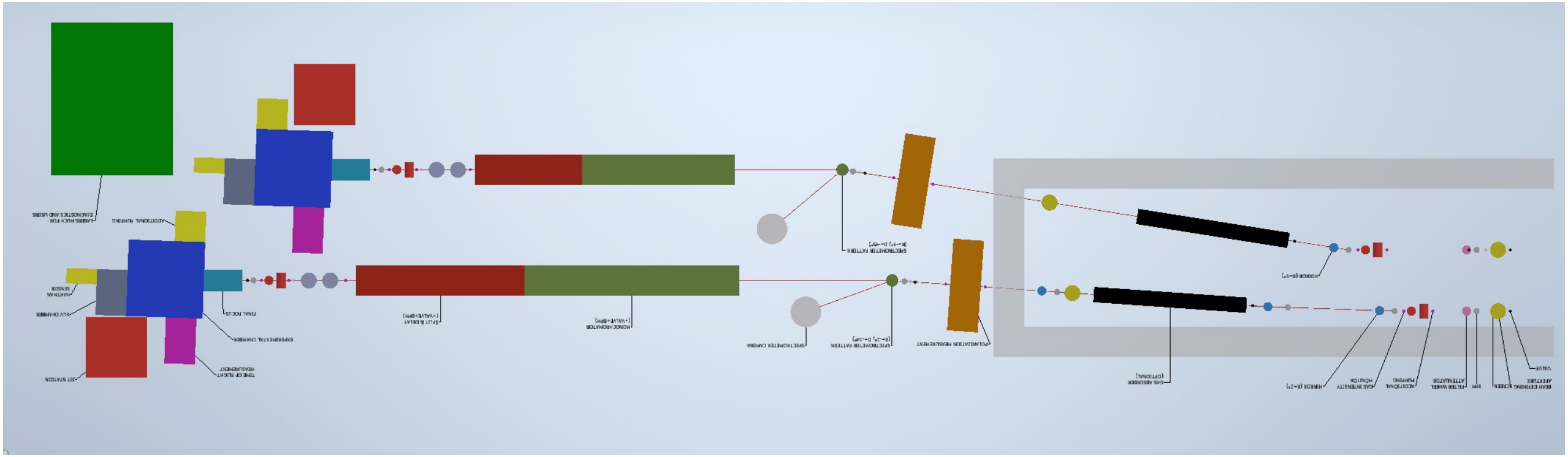

the components of the photon beamline are being defined (F. Villa talk):
the real vacuum chamber still need to be designed

Machine design criteria -1

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- After the first machine layout, prepared for the building definition taking into consideration only the dimensions of the main components, we restart the design of the machine replacing them with the real objects prepared for other projects or developed specifically.
- Following the indications of the beam dynamics, we placed first the accelerating sections and the magnets.
- Compact diagnostics tools have been designed and inserted in the strategic places in order to have good beam measurements saving important longitudinal space. (A. Cianchi)
- In this layout version we used magnets that had the required field, and field quality, for which we already had the design.

Machine design criteria -2

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- The design of the accelerating sections are in progress and the RF power distribution has been finalized
- The modulator & klystron drawings are those of the ordered prototypes.
- The dump have been studied by radio-protection group and the schematic design has been inserted.
- The vacuum components have been chosen and inserted in the layout but:
- all specially shaped vacuum chambers, such as those in the laser heater, in the chicane, in the the spectrometers, still need to be specified and drawn.

Accelerator & undulators layout

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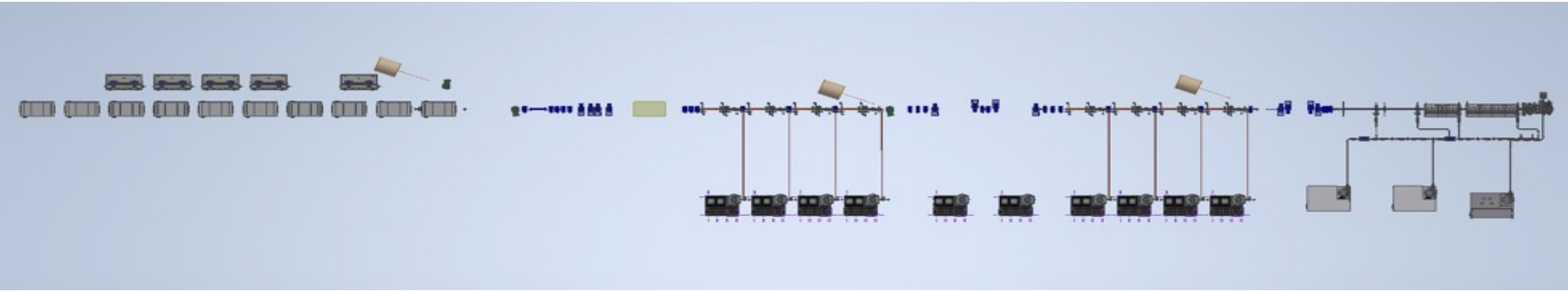

Injector

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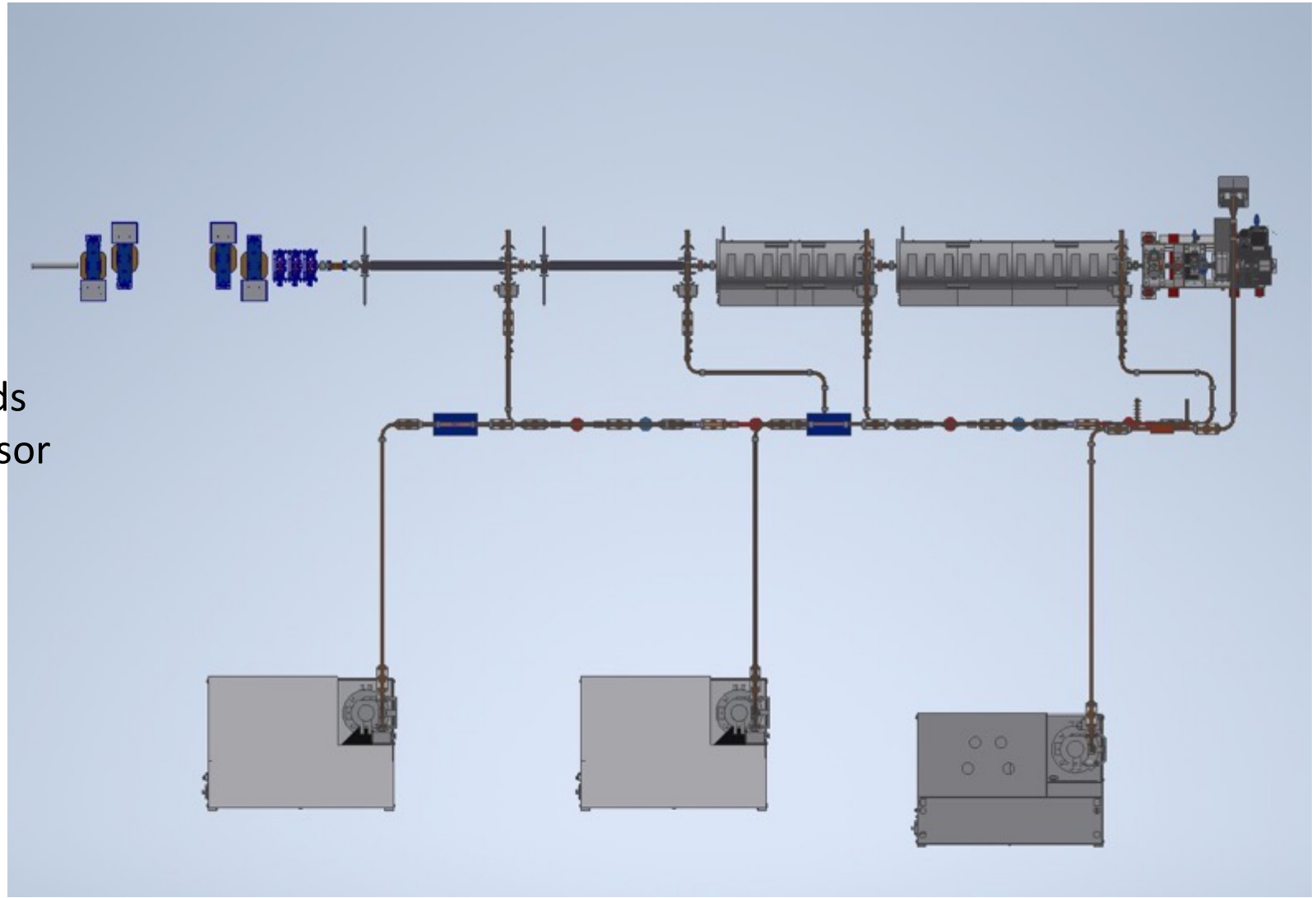
S-band photogun
S-Band accelerating section
First accelerating section Solenoids
Laser heater – magnetic compressor
X-band linearizer
Injector diagnostics
RF modulator & Klystron
RF waveguide network



RF distribution overview

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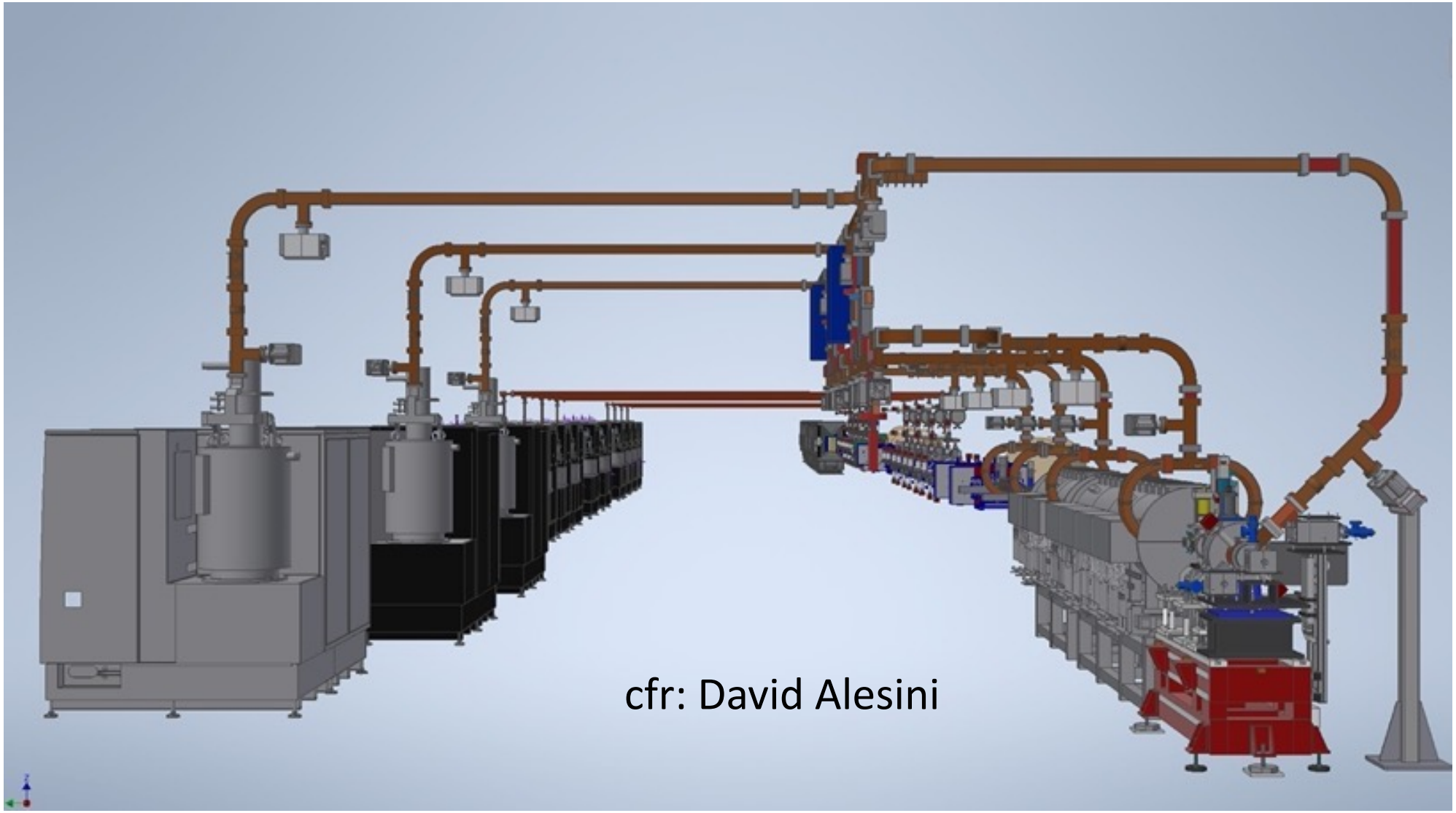

Low energy X-band linac & bunch compressor

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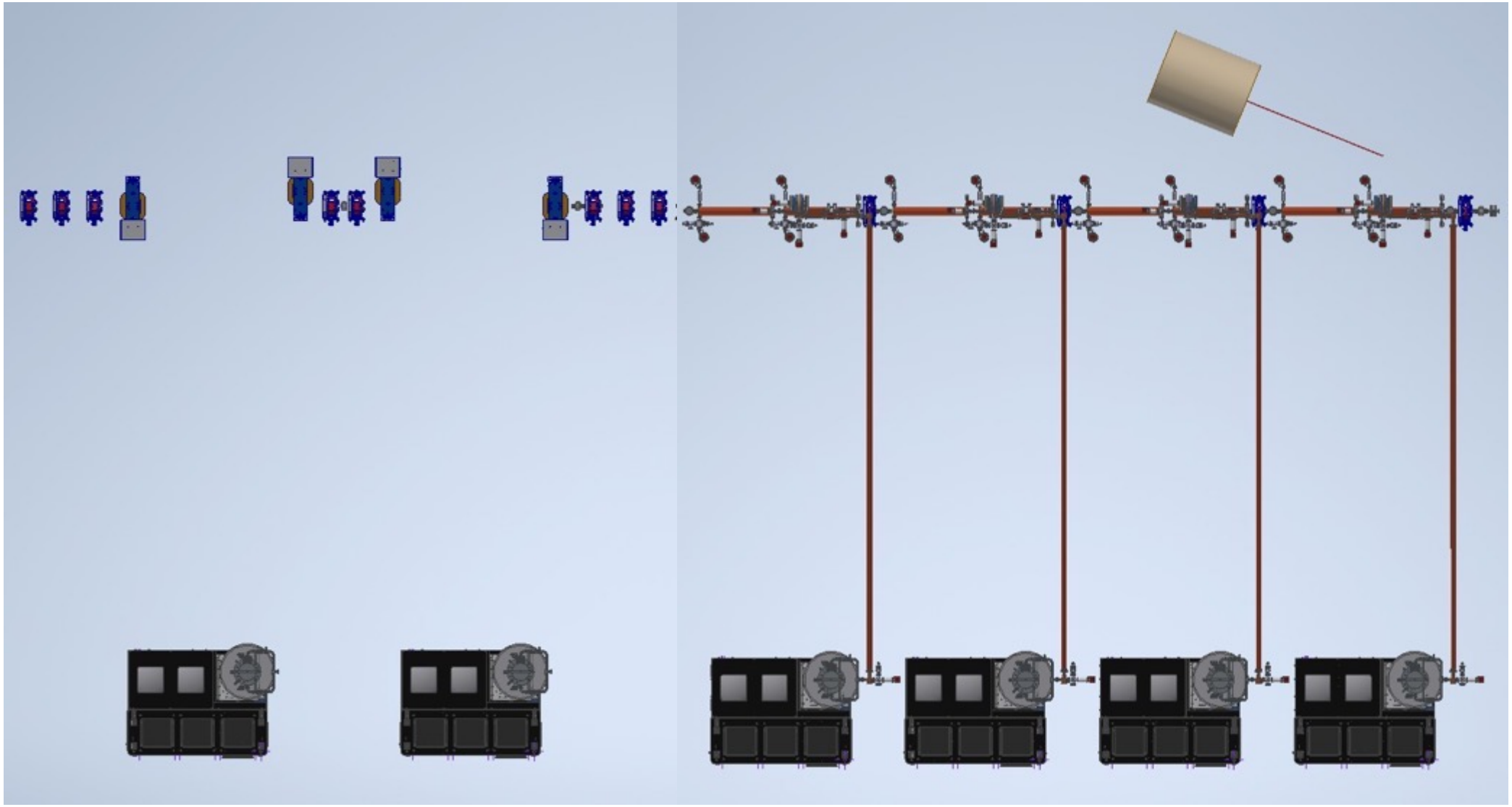

High energy X-band linac & Plasma acceleration module

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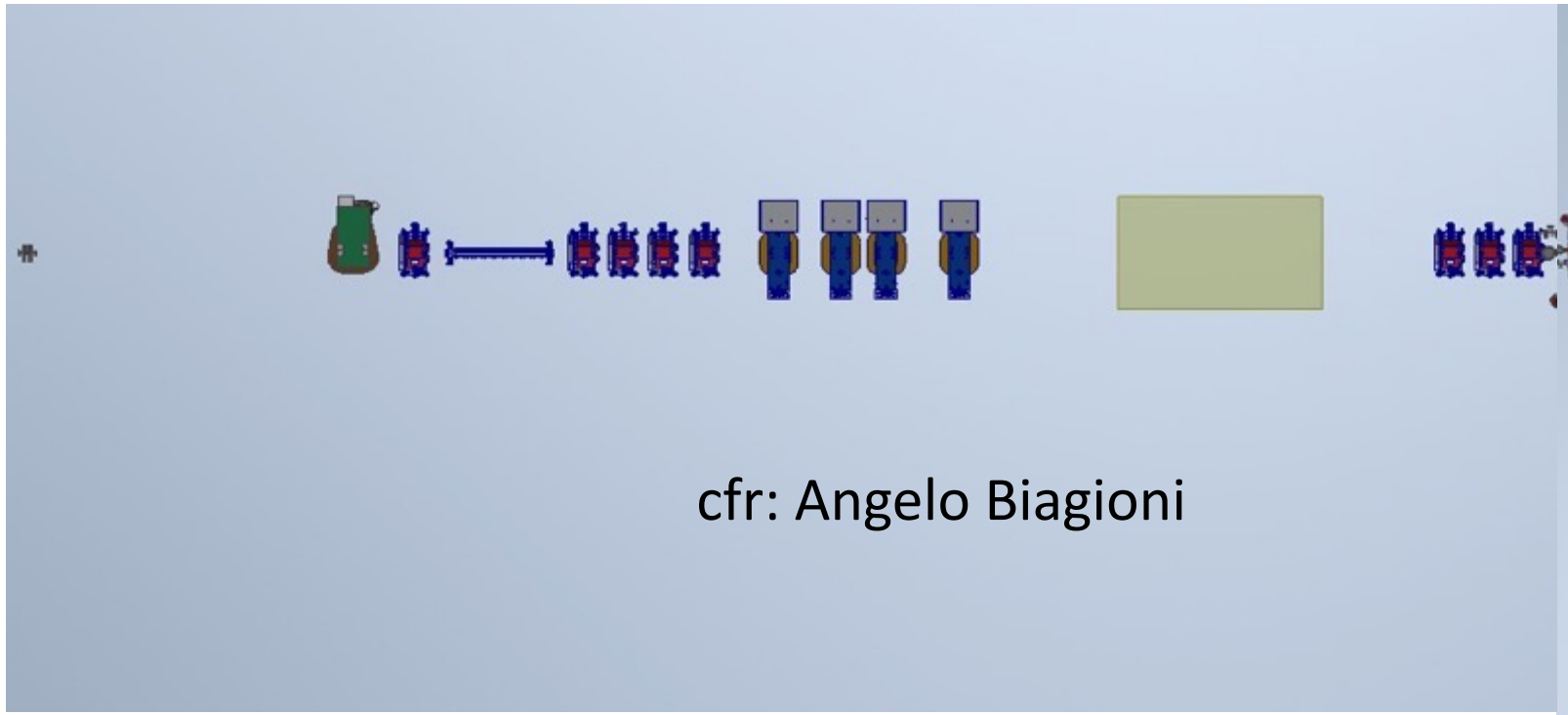
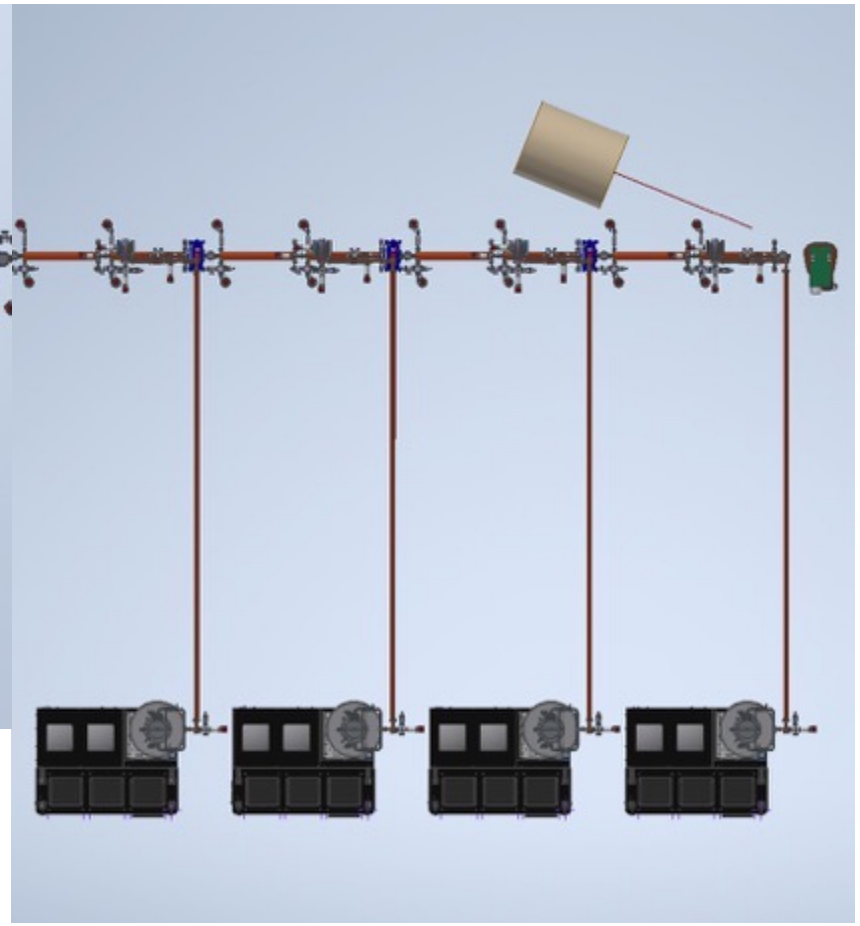


cfr: Angelo Biagioni



Undulators area

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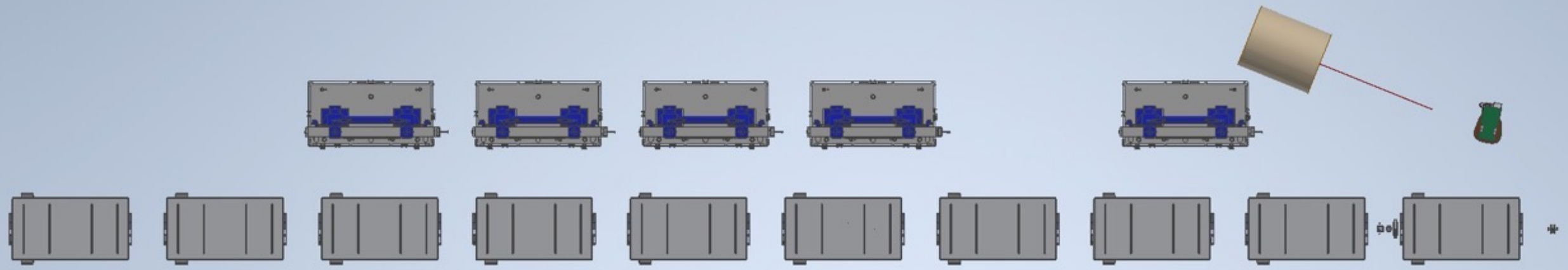

cfr: Luca Giannessi

Machine layout - TDR status

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- Accelerator & undulator definition 70%
- Photon beam lines & end stations 30%
- Building functional area definition 90%
- Description of components 70%
- Mechanical drawing for tender request 20%
- Writing 10%

3D accelerator & undulators view

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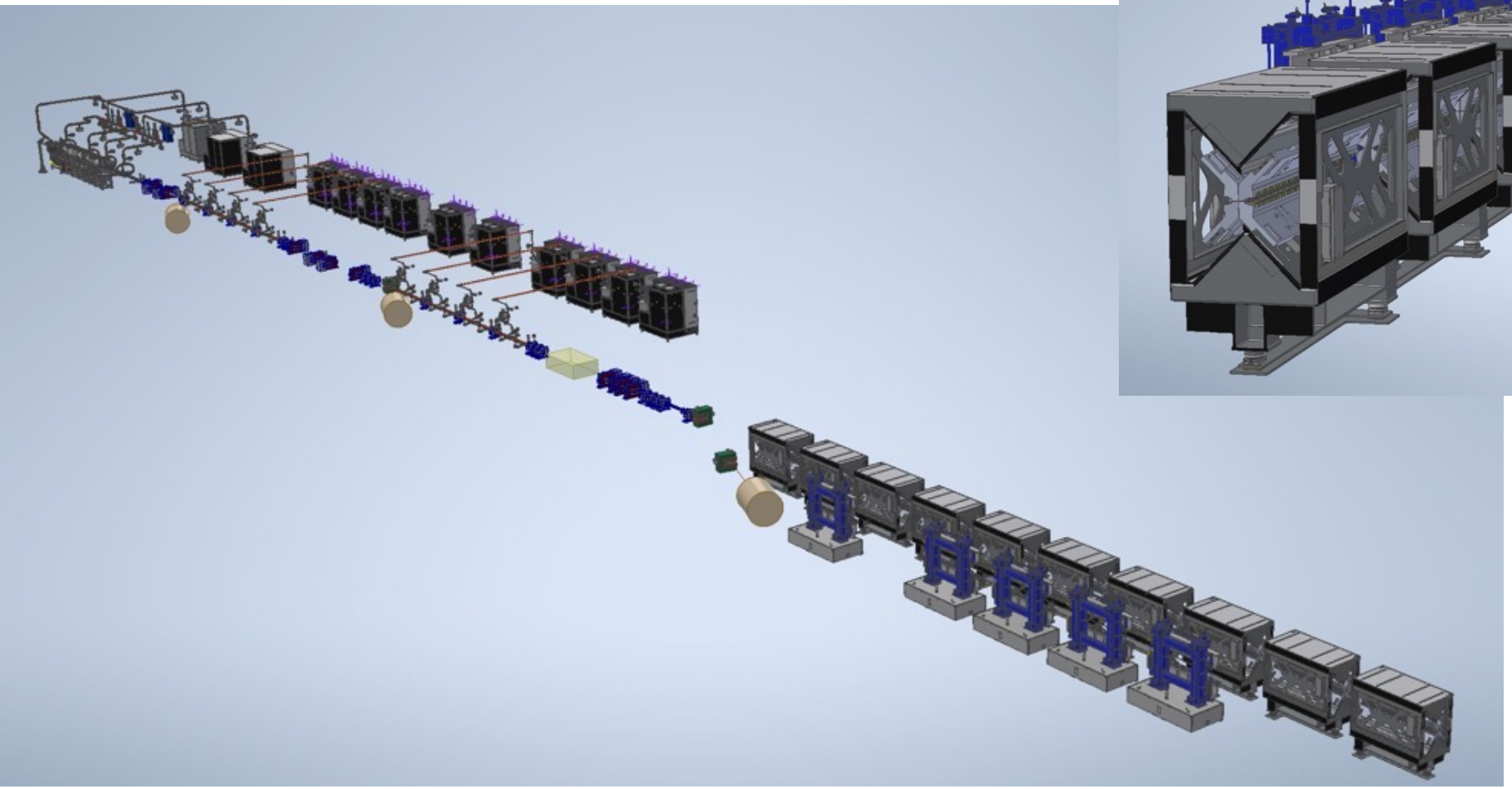

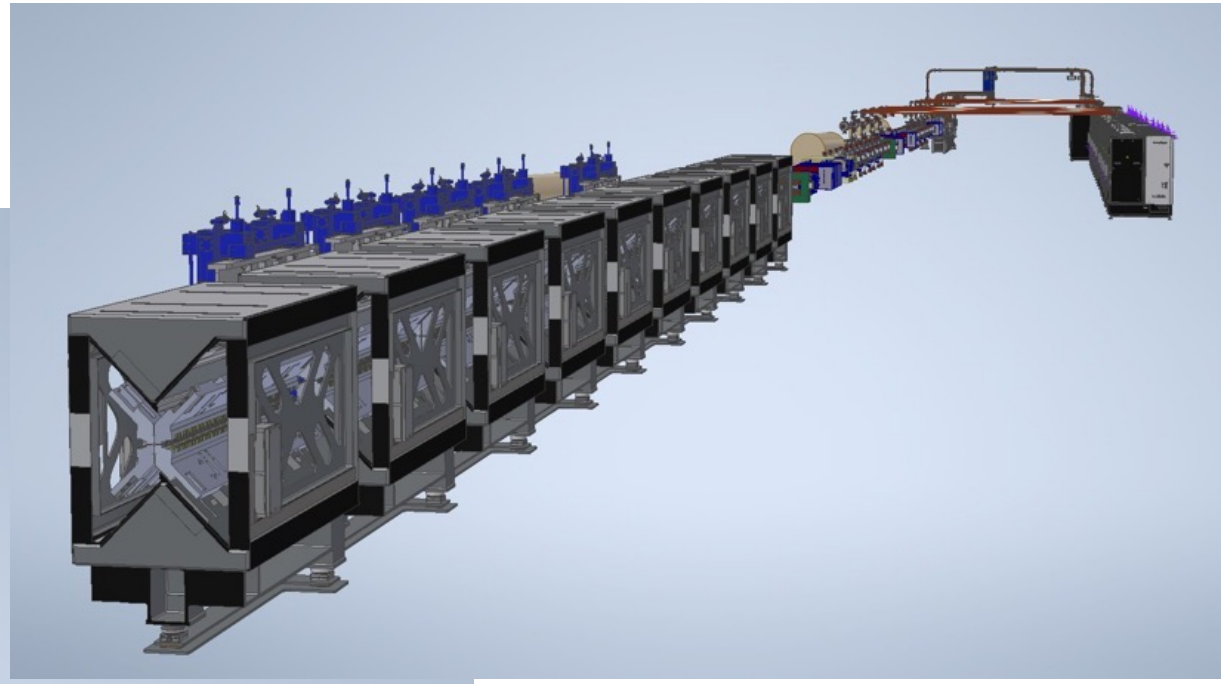

Thanks for the attention