EUROPEAN SPALLATION SOURCE

Electronic Platform Harmonization Strategy at ESS
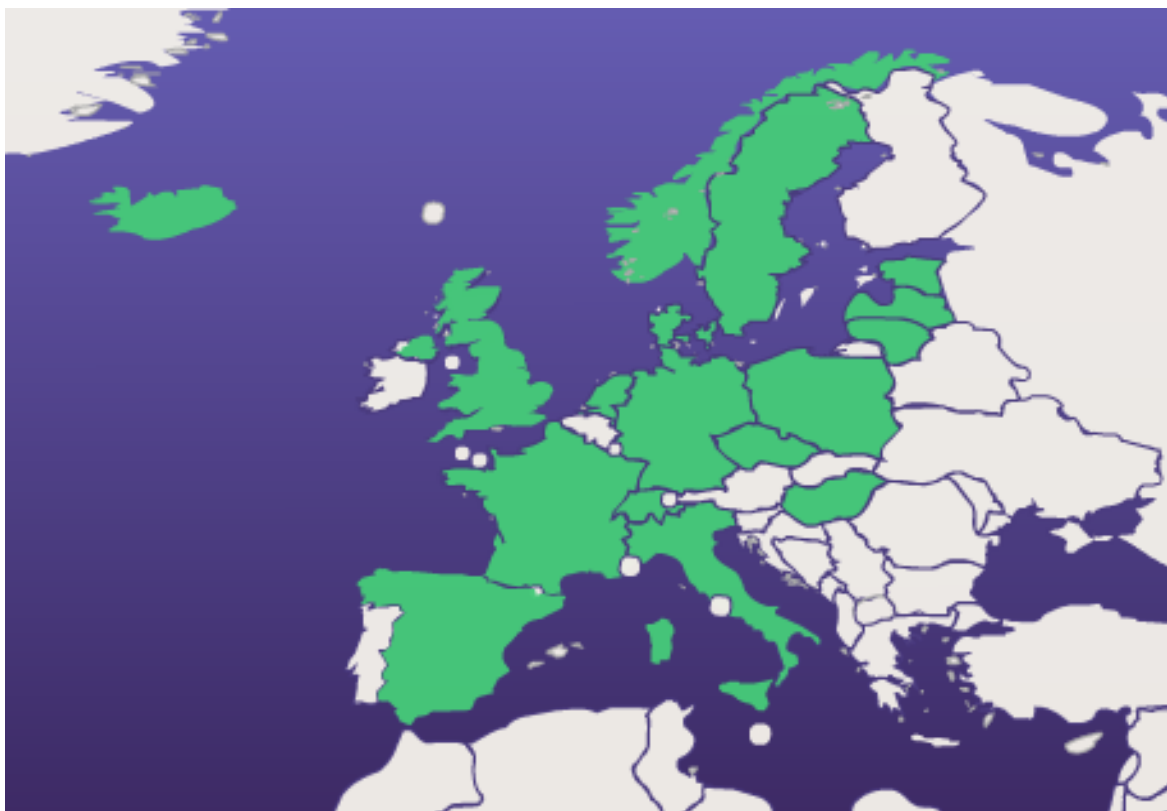
11 December 2012
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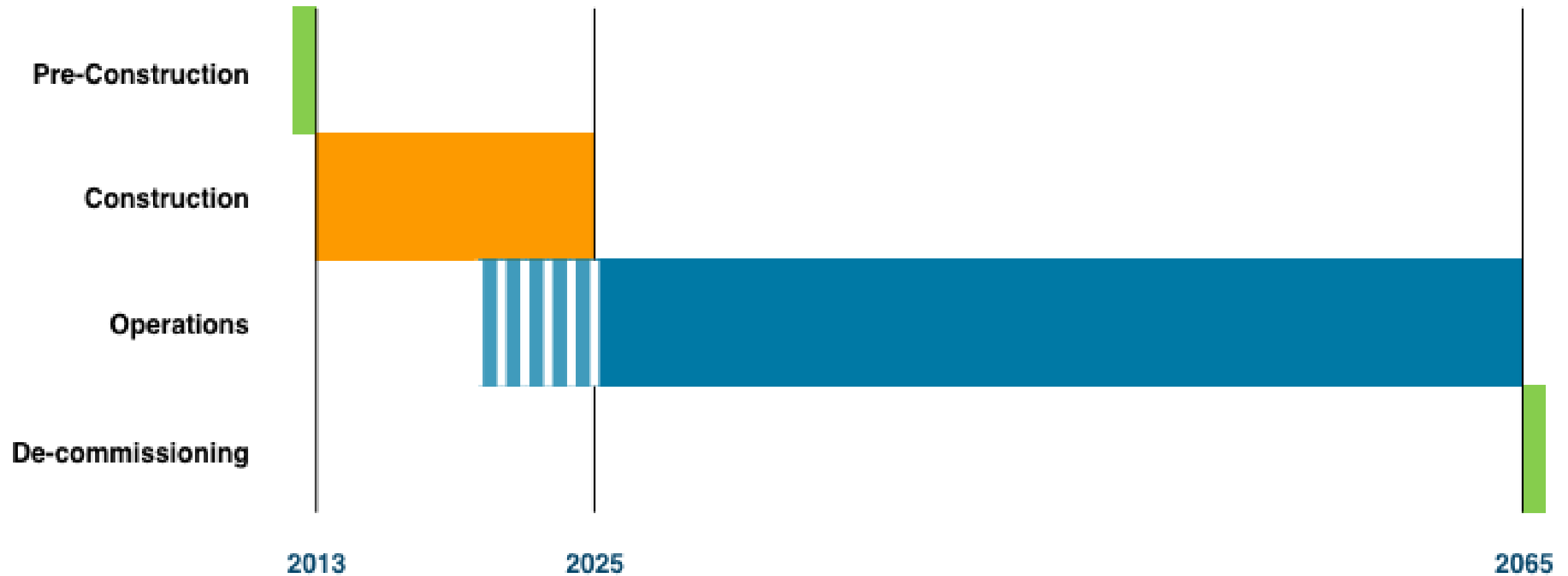# European Spallation Source

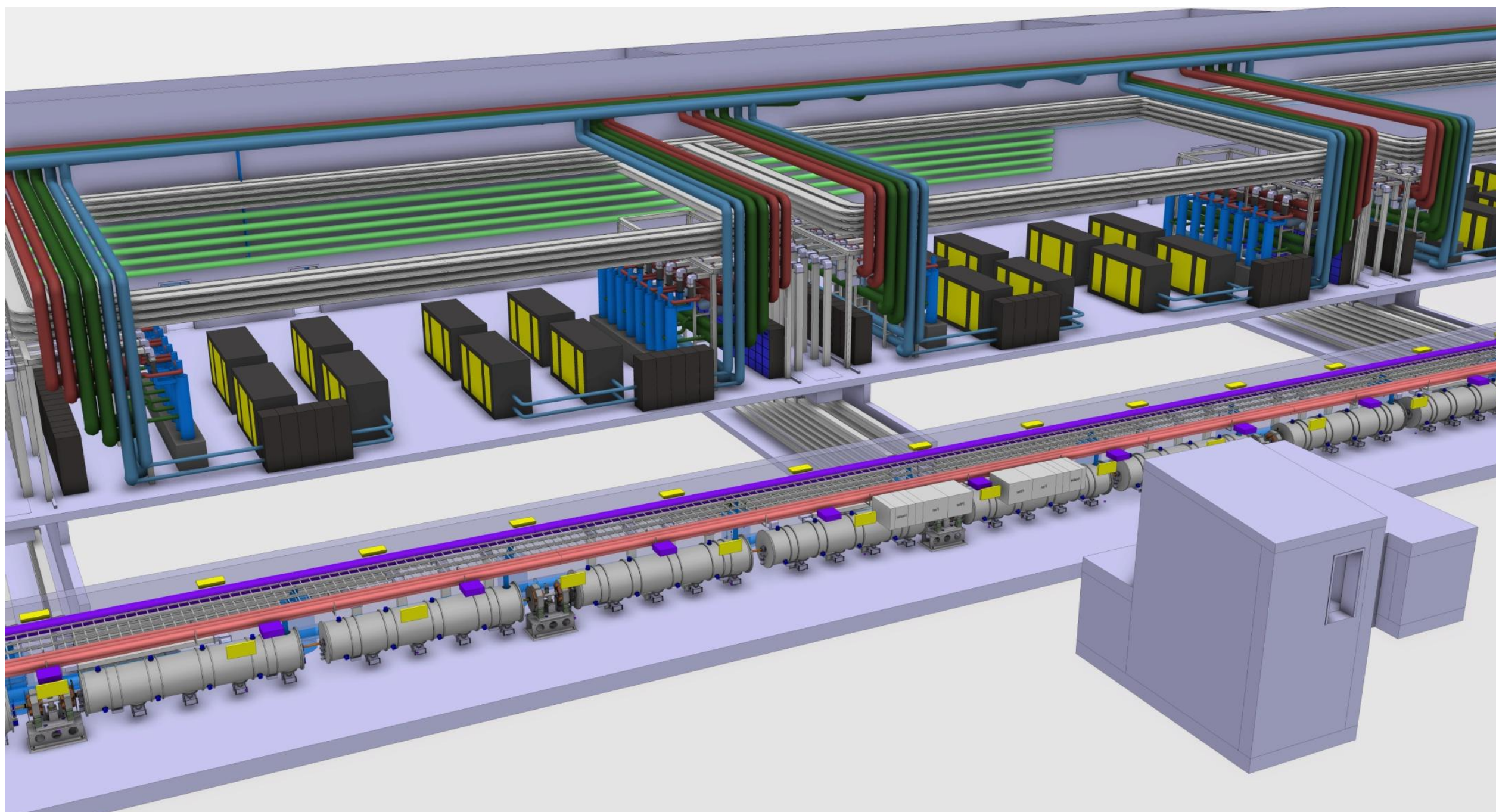*Anders J Johansson, Lund University*

ESS organisation

- 17 Partners

- ESS AB will own and run the installation.

Programme Phases

ESS Linac, elliptical section
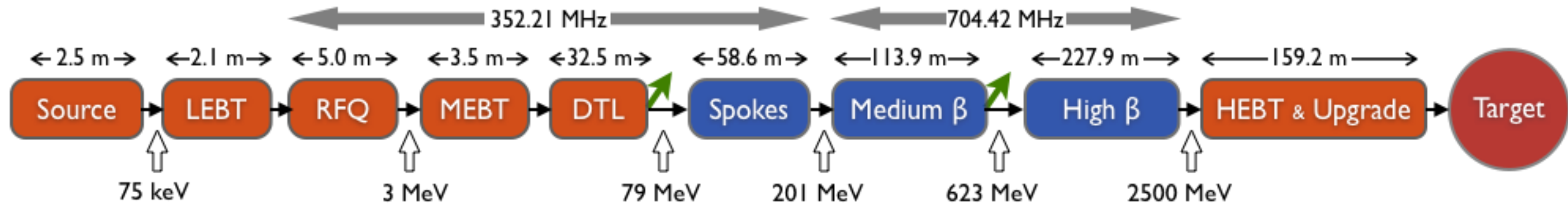
LINAC layout

FDSL_2012_05_15

	Length (m)	Input Energy (MeV)	Frequency (MHz)	Geometric β	# of Sections	Temp (K)
LEBT	2.05	75×10^{-3}	--	--	--	≈ 300
RFQ	4.95	75×10^{-3}	352.21	--	1	≈ 300
MEBT	3.53	3	352.21	--	--	≈ 300
DTL	32.58	3	352.21	--	4	≈ 300
Spoke	58.46	79	352.21	0.50	14 (2C)	≈ 2
Medium Beta	113.84	201	704.42	0.67	15 (4C)	≈ 2
High Beta	227.86	623	704.42	0.92	15 × 2 (4C)	≈ 2
HEBT (Projection)	158.66	2500	--	--	--	--

Large Electronic Platforms

- Control system
  - Control Boxes

- Beam Instrumentation
  - Beam Position Monitors
  - Beam Loss Monitors

- RF
  - Low Level RF systems

- Instruments
  - 22 in total

Driving Requirements

- High availability
- Fast service
- Long life

Solution:

- Redundancy
- Modularity
- Second source

Prototyping

- Decided to go for modular design with a crate.
- Evaluated possible versions for prototyping
  - Did choose MTCA.4 for high demand applications
    - Modern, Modular, Redundancy, IPMI, Partners
  - cPCI for less demanding systems
    - Cheaper alternative (?)
- Need for redundancy of different parts is evaluated, in order to meet availability requirement.

Keep cost down and Shorten development time

- COTS
  - Commercial Off The Shelf
  - But no black boxes!

- Second Source
  - Plug and play compatible possible?
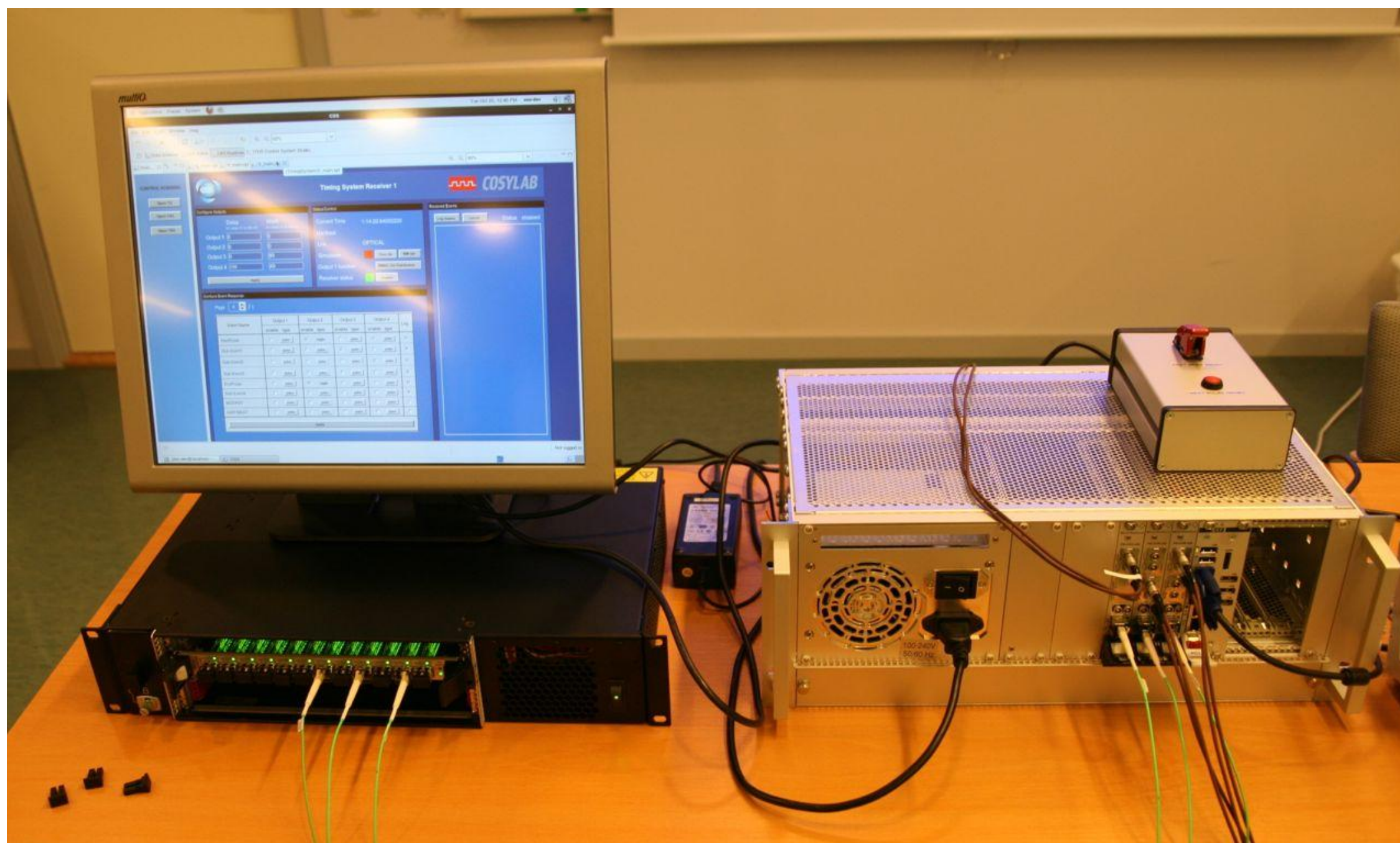
What we would like to see:

- Plug and play compatible cards, such as:
  - MCH
  - CPU
  - DAC
  - et

- Which, ideally, would be both from hardware and software side!

Control Boxes

- Control Boxes are the interface between the control system, running EPICS, and any hardware at ESS.

- Implemented by software running on a Linux computer.

ESS Timing System

MTCA evaluation started

END

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