

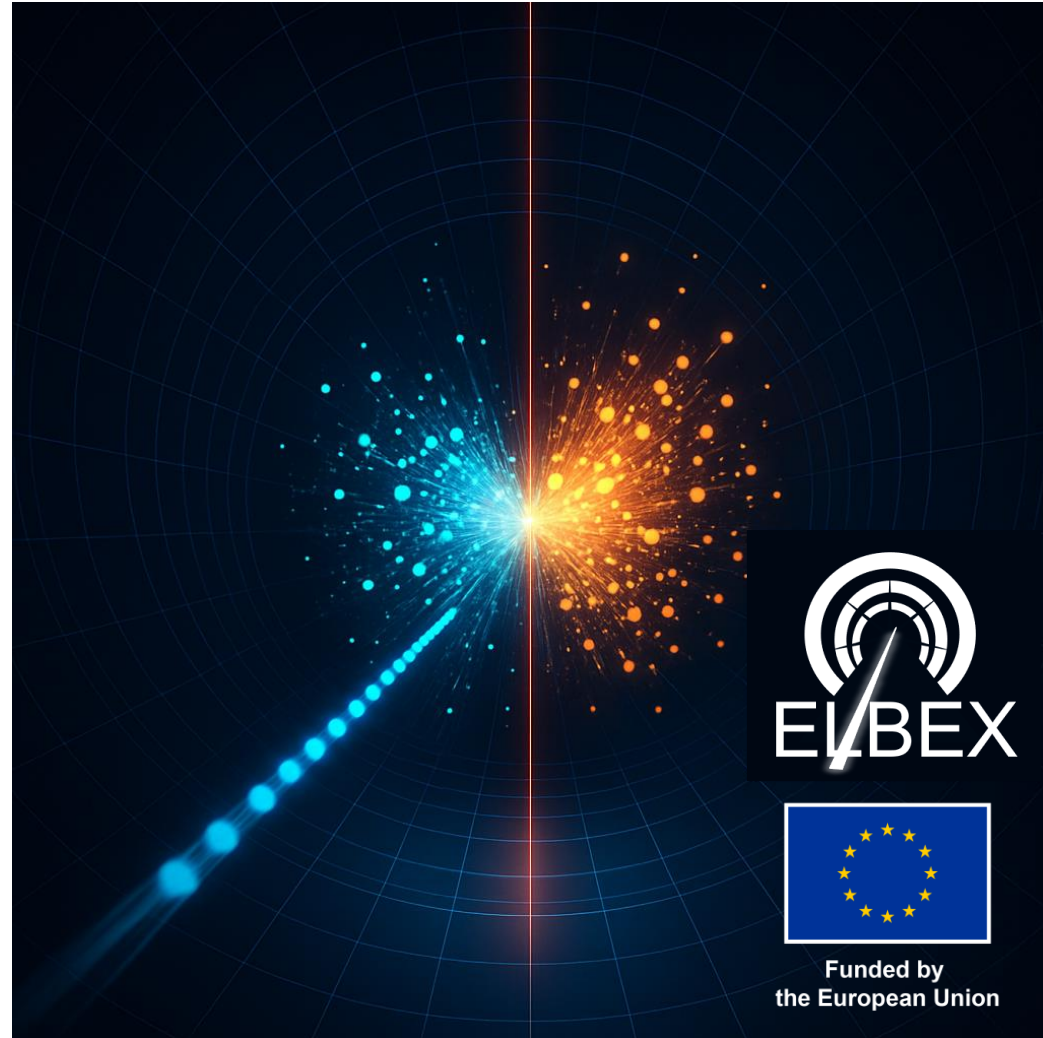
ELBEX

An Extracted Lepton Beamline at EuXFEL

Ties Behnke, Louis Helary, Ruth Jacobs,
Benno List, Marcel Stanitzki

PoF V MU-FPF retreat, 20.06.25

HELMHOLTZ

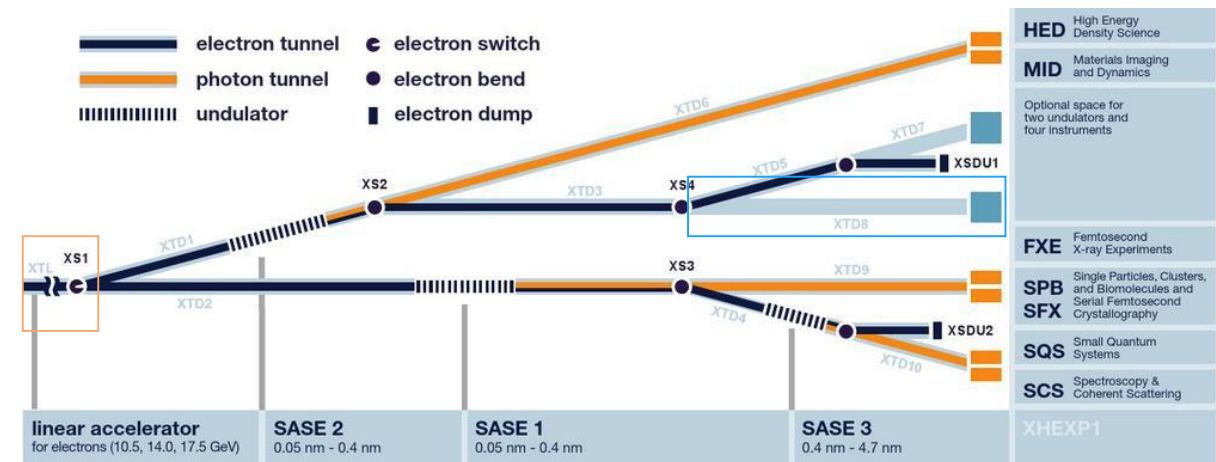
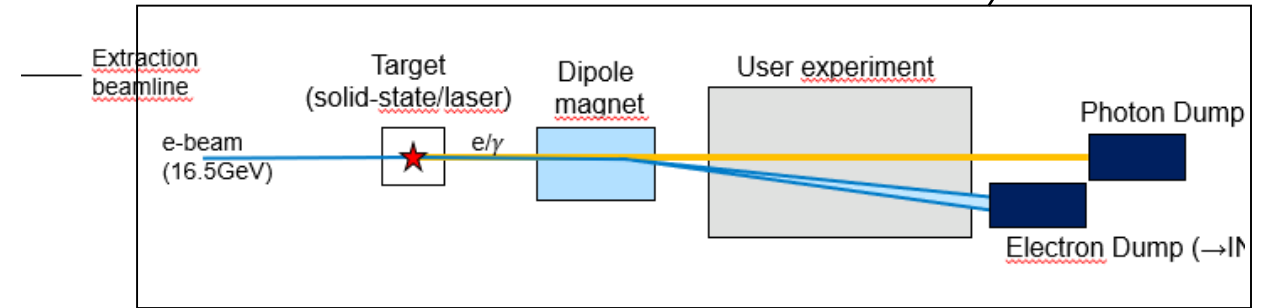
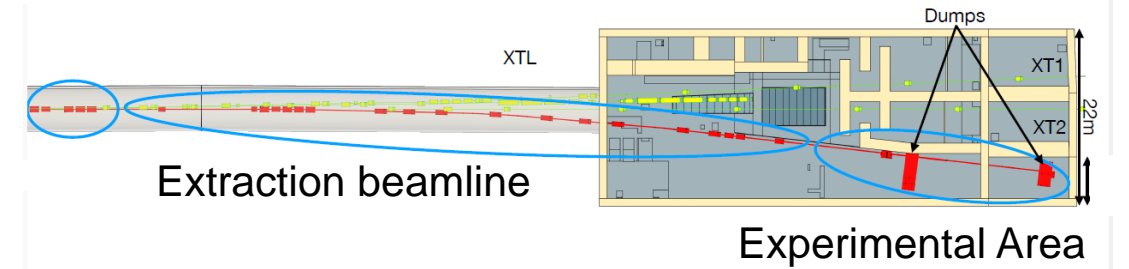


ELBEX overview

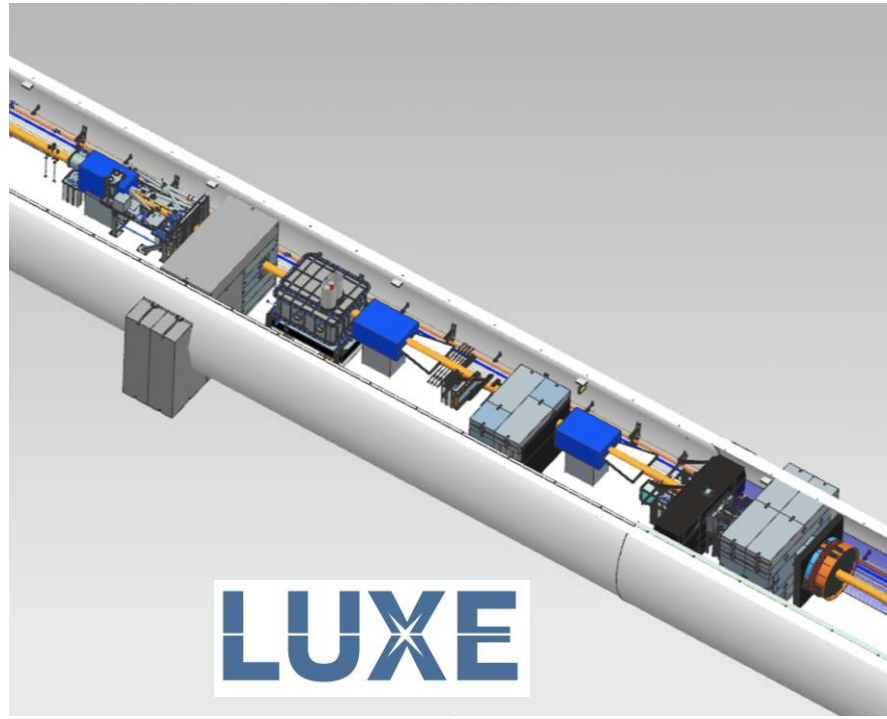
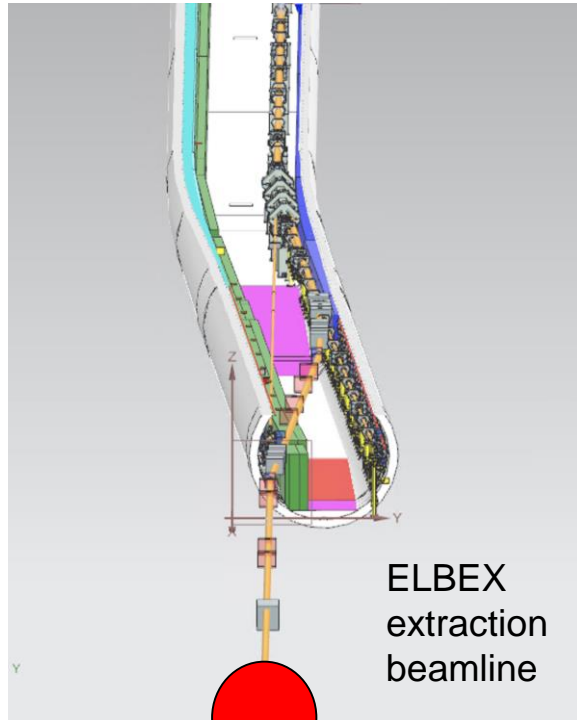
- ELBEX goal: prepare installation of a beamline to extract 16.5 GeV EuXFEL electron beam and provide it to users
- Received funding through Horizon Europe INFRA-DEV-01 (4.3M€ total, of which 3.1M€ to DESY, 5 years)
- Consortium partners: EuXFEL, INFN Padova, IFIC Valencia, U. Manchester

A new location for ELBEX

- Recently, opportunity to move ELBEX back in EuXFEL fan (XTD8) and co-use tunnel with planned fusion facility
- tunnel is separately interlocked
 - no extended shutdown needed for installation
 - access to the experimental area while the rest of EuXFEL is running
- more longitudinal space than XS1
 - allows multi-user facility
- plans for fusion project are still developing
 - ELBEX is part of the discussion



ELBEX beamline and users status

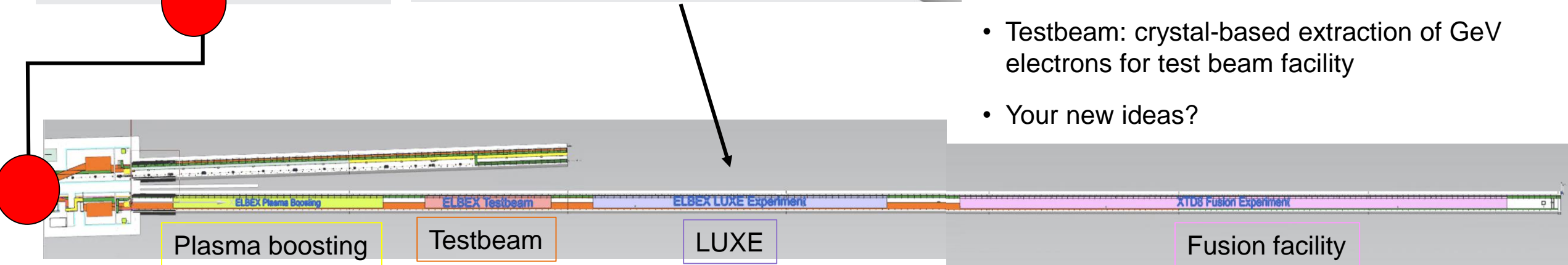


ELBEX Beamline:

- Design effort for beamline in new XTD8 location started
→ first concept
- Developing XTD8 safety and space usage concept
→ joint task force with EuXFEL

ELBEX users:

- LUXE: strong-field QED and long-lived particles search → see Matthew's talk
- Plasma: joint effort from FH and M to explore use of ELBEX for beam-driven energy doubling
- Testbeam: crystal-based extraction of GeV electrons for test beam facility
- Your new ideas?



Summary and Schedule

- ELBEX: New high-energy electron beam = new on-site opportunities for FH
- new location XTD8 is a game changer
- ELBEX strongly relies on FH expertise
- Technically driven schedule: ELBEX commissioning 2029, start of user operation 2030
→ matches well with PoF V period
- challenges: limited resources, interplay with EuXFEL fusion facility planning
- clear synergies other Helmholtz Programmes in FH (MT-ARD/DTS)

