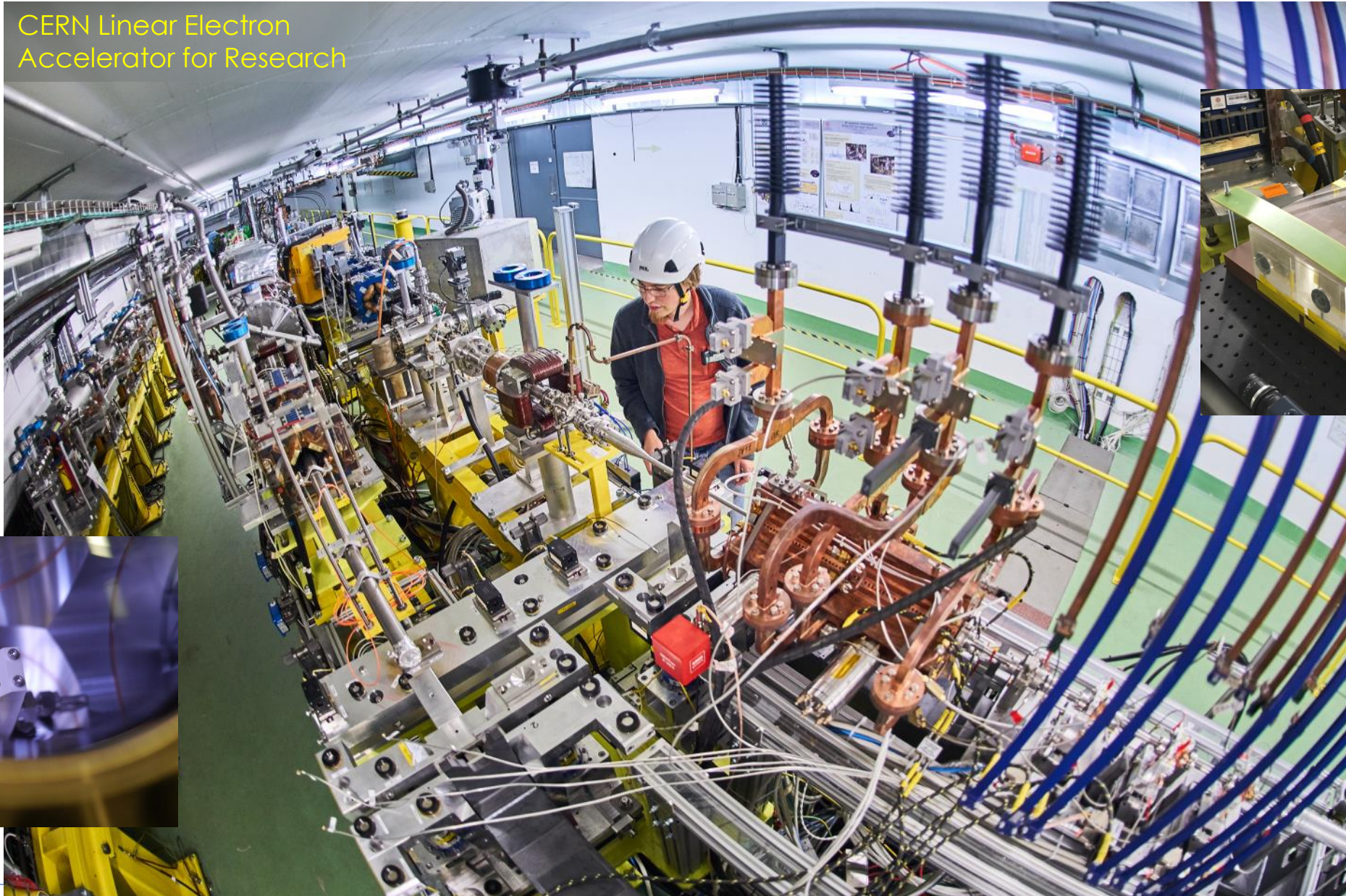


CERN Linear Electron  
Accelerator for Research

R. Corsini  
for the  
CLEAR team





1. User demand and role of the Scientific Committee:

- a. While it is important to respond rapidly to user requests and to maintain machine development and training opportunities, long-term experiments involving external users or demanding extensive support should be more closely followed-up by the Scientific Committee. The Scientific Committee could be included in the formal process of evaluation and approval of the beam-time request in EDMS.
- b. Evaluate the user needs requiring the installation of the new injector in CLEAR in time for a possible operation in 2023-2025.

a.

- A **formal process** of approval has been implemented in **EDMS**.
- The **Scientific Board** members are part of the formal approval in **EDMS**, commenting and potentially vetoing the requests.
- A **call for experimental request** is done **every year** during the YETS.
- The **Scientific Board** meets every year in **February** for assessment and evaluation of the requests received and to give overall recommendations.
- **Flexibility** is retained by the possibility of accepting further requests during the year
- **The Scientific Board** can be called in case **priorities** needs to be applied .

b.

- **No strong requests** for two-beam experiments were expressed by the user community, the **present option** is to make use of the **new injector as a separate beamline** for selected users in the present location (CTF2)

2. Resources for continued operation:

- a. An updated manpower plan for continued CLEAR operation in the future addressing the expected departures (e.g., safety) should be presented and approved by the ATS management. Possible synergies with cathode development and production for other electron guns operated at CERN should be identified. The responsibility for the configuration management for the CTF/CLEAR area should be defined.
- b. CLEAR offers unique opportunities for a wide external user community. In case that would grow to a level requiring significant extension of the facility it might be judicious to seek external funding (which might include, inter alia, contributions from industrial partners). The proposal of applying for EU transnational access (RADNEXT, ARIES) should also be pursued.

a.

- The **manpower plan** has been **updated** – in particular, a **new staff post** for operation (*W. Farabolini*) was funded. The **safety officer** has been substituted (*D. Gamba*, first as temporary, now confirmed). **Synergies** (notably with **AWAKE**) on cathode development and production are exploited and remain fundamental. Attempts were made towards a configuration management for CLEAR, but not pursued due to lack of support and internal resources.

b.

- **External funding** has been obtained through the EU transnational access project **EUROLABS** – mainly support to users, but also a limited amount for infrastructure improvements. Several other EU and Swiss funding opportunities were attempted, with some refusals but at least one (Swiss National Science Foundation - National Centres of Competence in Research) still ongoing. Additional funds and supports were obtained from **CHUV** through the **DEFT** collaboration and from the **KT** initiative **CIPEA**. We also acknowledge manpower contributions from **Oxford** and **Oslo U**.

### 3. Safety:

- a. The safety aspects have been adequately assessed but need to be followed up timely. We encourage to pay particular attention to the safety documentation considering the involvement of external users in the experiments. A clarification on the framework of operation of the CLEAR facility might be required.
- b. A replacement for the Facility Safety Officer should be identified (see also recommendation 2).

a.

- Safety officers (RP, ExSO, DSO) are now an **integral part** of the **formal approval** process. RP is routinely present at CLEAR weekly **operation meetings**. Special safety requirements for specific experiments (e.g., gas, cryogenic, ...) and needed updates of the safety infrastructure and tools (e.g. lead shielding) are followed up and included in the (growing) safety documentation.

b.

- See comments in R. 2.

#### 4. Improvements:

- a. Tools to generate automatic entries in the logbook for short faults are available and could be tested in CLEAR. This could facilitate the use of AFT.
- b. The correlation between measured beam parameters and dosimetry should be investigated in collaboration with the users as this could be beneficial for medical applications and irradiation to electronics.

a.

- Automatic fault tools **not implemented** due to lack of resources. **Improved documentation of faults** thanks to systematic entries in the e-logbook and especially thanks to **documentation in the weekly report**.

b.

- Full **online dosimetry** based on **beam measurements** (profile and charge) validated and now implemented. (Ph.D. thesis of *V. Rieker*, online tooling by *A. Malyzhenkov*).

## 5. Upgrades

- a. Based on the user needs assess the configuration and the resources required for installation of the new injector in CLEAR.
- b. Conduct a quantitative analysis of the needs of the communities using CLEAR to see if the need of a second beam line is justified; if so, conduct a quantitative analysis of the impact of the installation of a second beam line on machine availability and experiment turn-around time and assess the required resources for construction, installation and operation.

a.

- No real user needs for installation of new injector in CLEAR. Present alternative (operation in CTF2) pursued.

b.

- The second beam line design has been adapted to user needs (energy acceptance and optics flexibility as required in particular by medical applications) and further simplified, in order to minimize cost and manpower. A full design and an assessment of resources needed for the construction and installation of the second beam line has been carried out, and the material budget identified within the present operational budget + EUROLABS contribution. Manpower is also available from the support groups and the activity is included in the PLAN tool. The second beam line construction and installation has been approved by the CERN management. Commissioning by the CLEAR operation team is planned for spring 2025 – about 6 weeks estimated commissioning time (can also be interleaved with operation).

# Thanks for your attention!

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L. Wroe, E. Granados, M. Martinez, S. Curt, D. Gamba, ...*

