

EUROCHAMP-2020

WP5 - MS33: “Definition of criteria for platform eligibility in a physical access program”

The list of eligibility criteria for exploratory platform in the ACTRIS access programme has been defined thanks to several contributions by the EUROCHAMP community and through constructive exchanges between the EUROCHAMP and the ACTRIS communities.

The development of such list is the result of a series of exchanges and contribution inside the EUROCHAMP group and between the EUROCHAMP and the ACTRIS communities. In particular, the requirements have been firstly discussed in the ACTRIS PPP meeting of Bucharest (September 11th – 15th, 2017); they have been then presented in their first draft version to the EUROCHAMP community during the WP2, 3 and 9 workshop in CERN (September 27th – 29th, 2017) and further discussed inside the community during the Annual Meeting (November 15th – 17th, 2017). Following several email exchanges between the two communities, a concept paper focused on technical concepts and requirements for ACTRIS_ERIC Exploratory Platforms.

In this concept paper it is stated that Exploratory Platforms will have to offer hands-on access to world-class Atmospheric Simulation Chambers in Europe. The research facilities shall be selected based on their uniqueness within Europe and their ability to constitute an ensemble offering a wide range of experimental capabilities at the forefront of research advances in atmospheric simulations and related studies. For the concerned facilities physical access will be mandatory

Due to the diversity of topics addressable with Atmospheric Simulation Chambers, they all exhibit a high degree of specialized emphasis that prevent from defining common minimum configuration or optimal configuration. Nevertheless, the ACTRIS Atmospheric Simulation shall all be equipped with the state-of-the-art equipment required for reaching their main scientific targets (see ACTRIS PPP deliverable 5.2, 4.1.1). In particular, the operation and calibration principles of their base instrumentation (see ACTRIS PPP deliverable 5.2, 4.1.2.1) shall be compliant with the recommendation of the related TCs when available. Reliable data storage local equipment for level 0 and 1 data as well excellent record in the data provision (level 2 and 3) to the EUROCHAMP-2020 datacenter will also be critical.

More critically, the Atmospheric Simulation Chambers eligible to the ACTRIS-ERIC physical access programme will have to be very well characterized and to have implemented traceability of the experiments (documentation, protocol, calibration, reference experiments etc.). They shall provide comprehensive user services, good conditions of access and the capacity to provide high-quality, research-driven training of young scientists and new users. Consequently, qualified dedicated technical staff shall be available to welcome, train and assist users.

At the selection process level, these characteristics shall be ascertainable based on records of successful previous transnational access demonstrating also the attractiveness of the installation. Exploratory

Platforms that a) develop novel ground-breaking concepts with regard to simulations of atmospheric processes and investigations of fundamental physical-chemical properties and b) cannot present a track-record due to the nature of being novel, these characteristics shall be defined on the basis of their uniqueness of equipment and expertise of staff, and a science-based identification/justification of attractiveness.

In summary, eligibility criteria of Exploratory Platforms inside the ACTRIS access program will be based on three main aspects:

- **Scientific excellence**

ACTRIS Atmospheric Simulation Chambers allow the users to perform front-line research on atmospheric processes related to aerosols, clouds and reactive trace gases under conditions that are controllable, reproducible and relevant to the ambient atmosphere. In particular, they shall allow the understanding of the key drivers of the processes investigated. The platforms must therefore be well equipped and will involve state-of-the-art instrumentation, which might be exploratory itself.

ACTRIS Atmospheric Simulation Chambers shall be well characterized so that the unavoidable artefacts related with, e.g., wall reactivity, volume limitation, and irradiation and radiation characteristics of light sources and variations of detectors, are well known and quantified. Their consequence on the study of the main scientific target shall be known and every time it is possible dedicated up-to-date model codes and instrument characterization shall be available.

- **Uniqueness and diversity**

ACTRIS Atmospheric Simulation Chambers will form an ensemble of complementary installations at the cutting edge of technology that are highly instrumented and versatile. Large indoor and outdoor chambers are especially suited to process studies performed under realistic atmospheric conditions and are also rapidly developing into useful tools for investigating the atmospheric transformations of real-world emissions, such as those from vegetation, vehicle exhaust and wood burning, and for studying processes at the interfaces and/or in clouds as well as newly emerging environmental threats such as bioaerosol or impact on human health. These large-scale chamber facilities are complemented by smaller units, which are typically used to investigate very specific chemical processes, such as kinetic and mechanistic details of gas-phase oxidation processes, often as a function of temperature and pressure, and by sophisticated laboratory facilities, which focus on the investigation of fundamental physical, chemical, and optical properties of short-lived atmospheric constituents.

- **Access capabilities**

ACTRIS Atmospheric Simulation Chambers will be open to physical access to users. They can also be used for the need of the research infrastructure (e.g., comparison campaign, calibration and validation experiments, new methodology and technology testing, etc.). The suitability for physical access will depend on uniqueness of equipment, available logistics, expertise, desired simulated conditions and controllability of the experimental set-up during a campaign. Physical access to ACTRIS Atmospheric Simulation Chambers may also include commitment of the entire facility on user request for specific

campaigns and the development and testing of ground-breaking new concepts. In general, suitability of a simulation platform for physical access requires:

- Possibilities to apply the platform on user request for specific investigations, in specific modes and under specific technical conditions
- Possibilities to set up and run the platform together with other instruments of the user, including respective local capacities for the supply of power, water, technical gases, internet connection etc.,
- Resources to host users including working (offices) and storage space and all necessary facilities,
- Capabilities to train and support users by experienced staff.

Physical access to Atmospheric Simulation Chambers will be managed by the SAMU. Next to the general suitability of a platform for physical access, which can be identified in the labelling process, the campaign-dependent actual abilities have to be proven case by case.

In order to provide a general overview of the Exploratory Platforms' concept, developed in ACTRIS PPP, an extract of Exploratory Platforms' general principles in the deliverable 5.2 is included, as annex to this document.

Annex 1

General Principles for ACTRIS Exploratory Platforms

ACTRIS Exploratory Platforms provide key support to research projects and training activities for the atmospheric and climate science community. They allow users to study atmospheric processes, develop new techniques and observation capabilities or test and calibrate instrumentation by providing laboratory and mobile facilities. ACTRIS Exploratory Platforms follow common general principles listed hereafter. The compliance will be proven through the ACTRIS labelling process (see D5.3).

General Principles

1. ACTRIS Exploratory Platforms must support research, development or training activities related to short-lived atmospheric constituents targeted by ACTRIS, i.e.

- aerosols,
- clouds and
- reactive trace gases,

including the vast variety of related processes in the Earth system.

2. ACTRIS Exploratory Platforms are committed to long-term operation in order to support research, development and training activities continuously over the lifetime of ACTRIS.

3. ACTRIS Exploratory Platforms are operated by personnel with identified expertise in running experiments and complex platform instrumentation. Support for training of personnel in the use of ACTRIS instrumentation will be provided by the Topical Centres.

4. The instrumentation operated at ACTRIS Exploratory Platforms follows the ACTRIS recommendations, whenever applicable (see D5.1). Specific modifications of instruments necessary for exploratory purposes are documented and agreed with the associated Topical Centre. Instrumentation that is not supervised by any ACTRIS TC is applied following best practice and/or available international standards.

5. Measurement methodologies and procedures for operating instruments at Exploratory Platforms comply with the standards of calibration, operation and quality assurance defined and recommended by the Topical Centres, whenever applicable (see D5.1). Specific methodologies and operation procedures applied for exploratory purposes are documented and agreed with the associated Topical Centre. Methodologies and procedures that cannot be supervised by any ACTRIS TC follow best practice and/or available international standards.

6. Data from measurements performed for ACTRIS purposes at Exploratory Platforms are made available to users through the ACTRIS Data Centre (DC). Data are transferred to the ACTRIS DC following the procedures, formats and timelines described in Chapter 4 and in the Data Management Plan (D4.2).

7. ACTRIS Exploratory Platforms provide physical access for users following the specific requirements listed in Chapter 5 (see ACTRIS PPP deliverable 5.2, 5) and in future D6.3.