Contribution ID: **10**   Type: **WG5 - Characterization techniques - facilities**

Towards Constellation 1.0: Autonomous Control Systems for Laboratory, Testbeams & Beyond

Thursday, 13 November 2025 12:10 (20 minutes)

The operation of instruments and detectors in laboratory or beamline environments presents a complex challenge, requiring stable and simultaneous operation of multiple devices, often controlled by separate hardware and software solutions.

Constellation is a flexible and network-distributed control and data acquisition software framework tailored to laboratory and beamline environments that addresses the requirements. The framework is designed with a focus on extensibility, providing a streamlined interface for instrument integration. It supports efficient system setup via network discovery mechanisms, promotes stability through autonomous operational features, and provides comprehensive documentation and supporting tools for operators and application developers such as controllers and logging interfaces.

This presentation will highlight recent advancements in development, and will outline the road towards the upcoming release of Constellation 1.0 as a stable, production-ready framework. Several applications will be discussed, including deployments at beamlines, in spent nuclear fuel characterization, and in the BL4S program.

Type of presentation (in-person/online)

in-person presentation

Type of presentation (I. scientific results or II. project proposal)

I. Presentation on scientific results

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