



SPALLATION
NEUTRON
SOURCE

14th Annual MicroTCA Workshop
December 2025

Status of MicroTCA at the Spallation Neutron Source

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Spallation Neutron Source



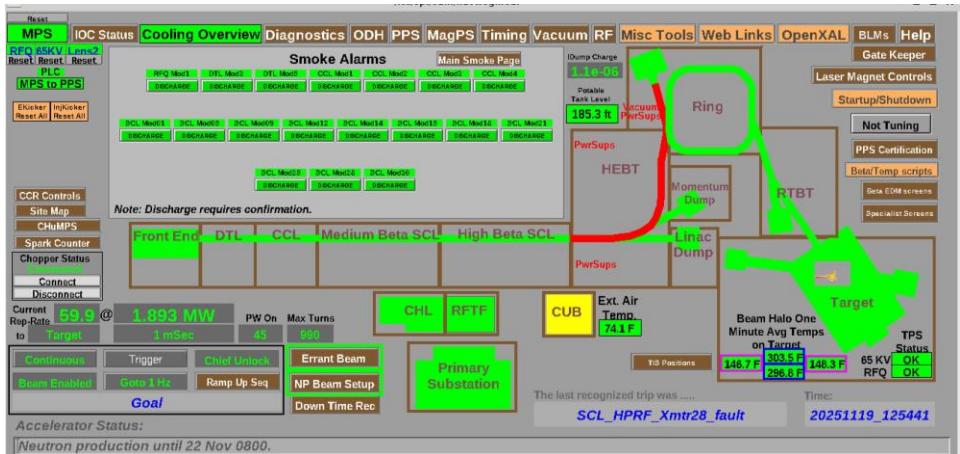
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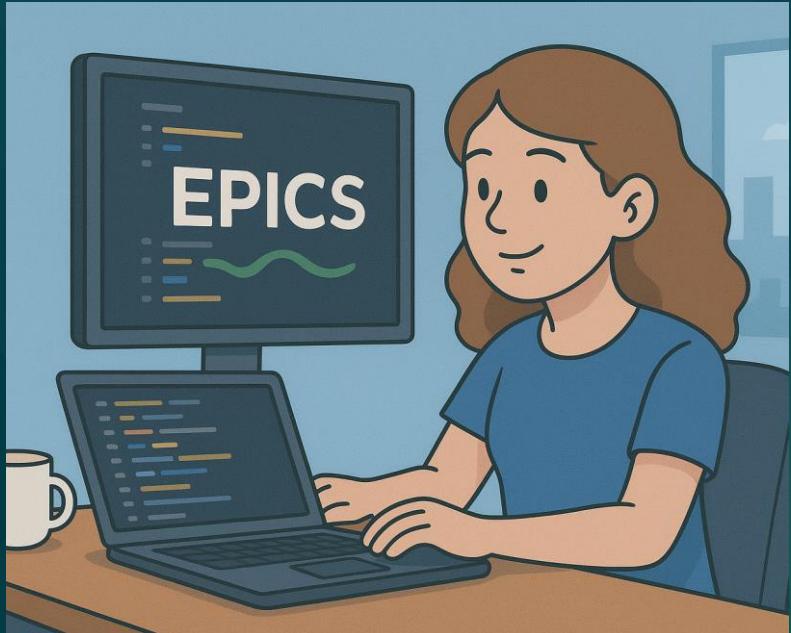


What will be covered today?

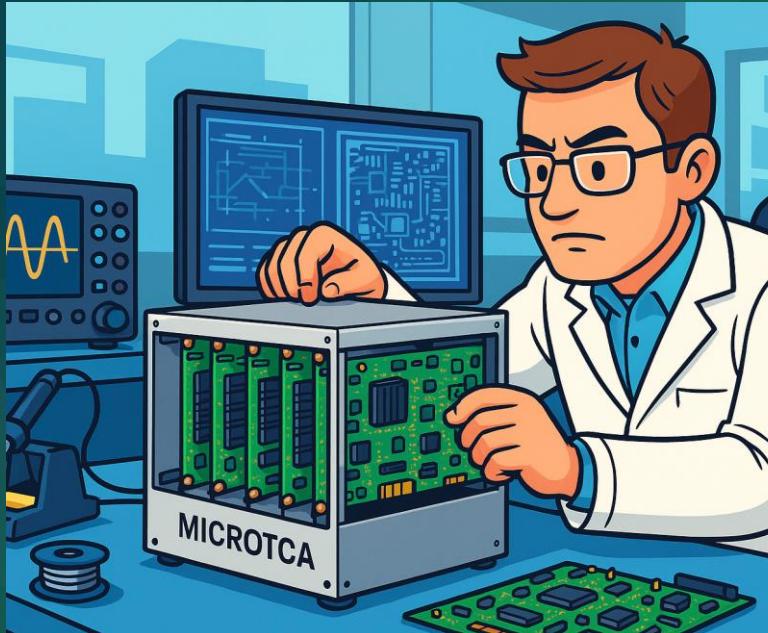
- Controls Integration Group at SNS
- MicroTCA at SNS
 - MicroTCA Systems in Production
 - MicroTCA Systems in Development
- Software Integration – EPICS
- EPICS Collaboration Meeting MicroTCA Workshop



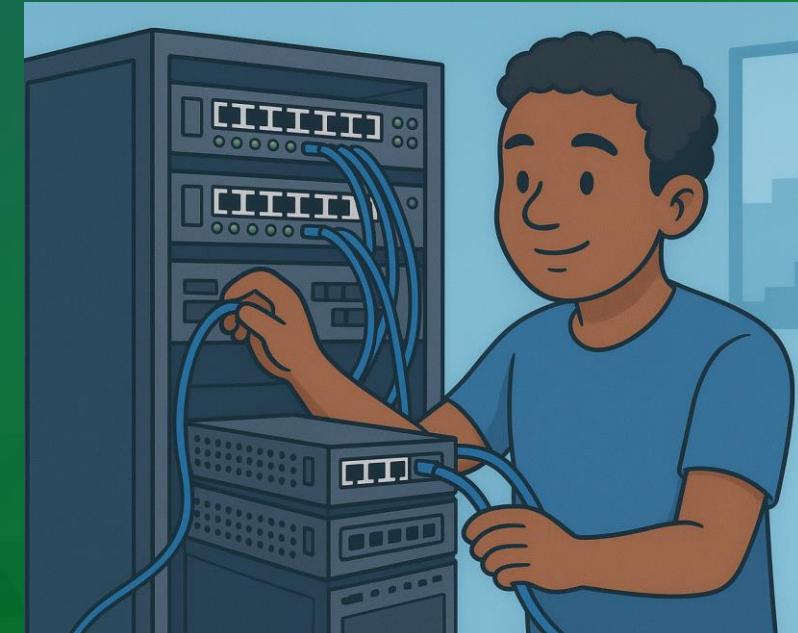
Controls Integration Group



Software



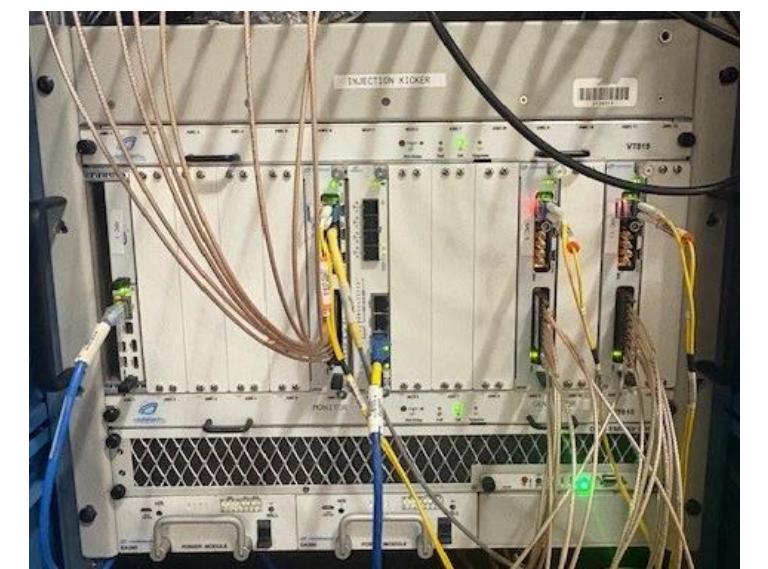
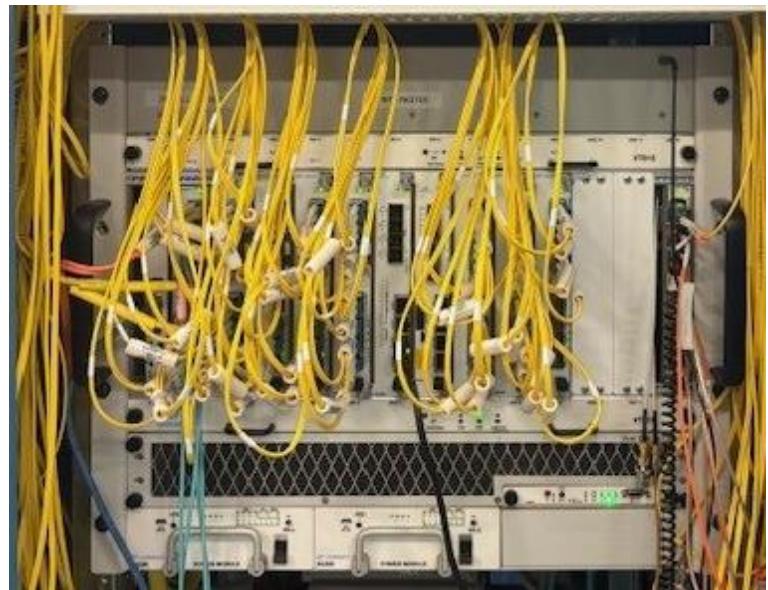
Hardware



Infrastructure

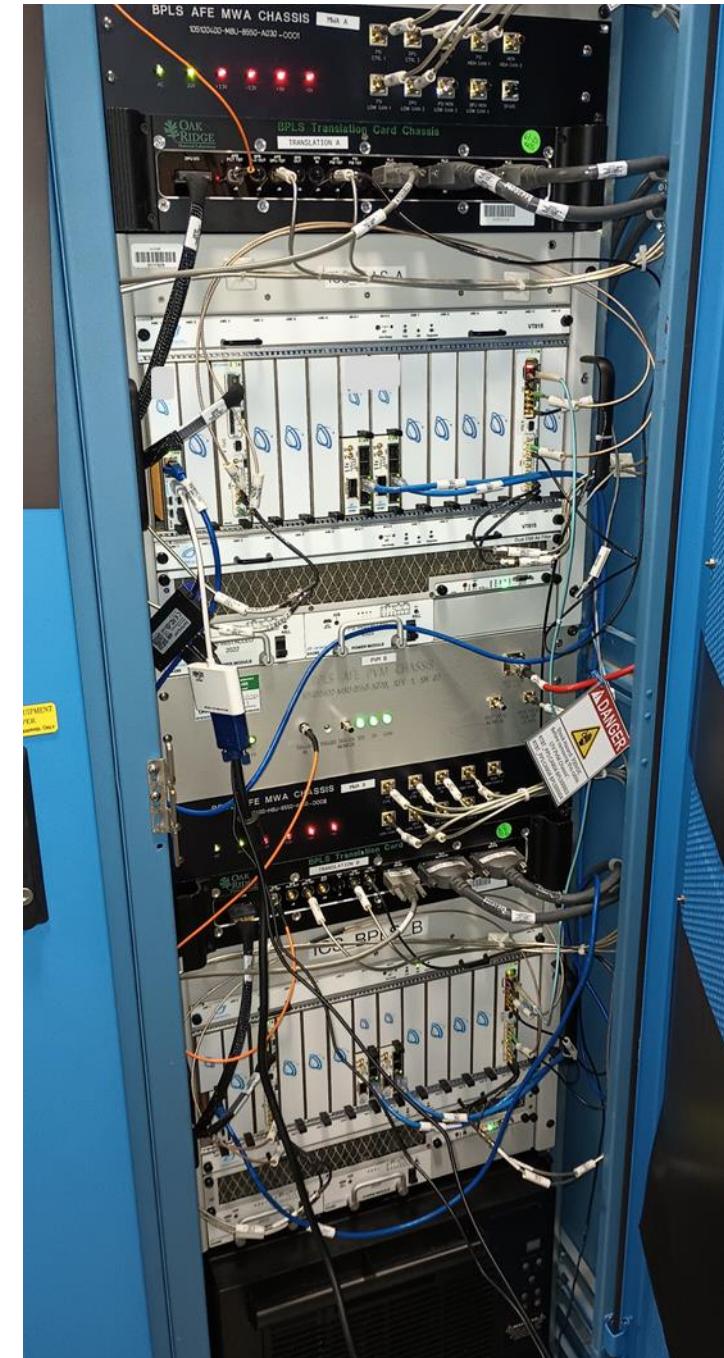
MicroTCA in Production at SNS – Controls Integration

- Machine Protection System
 - MPS Master
 - MPS Field Node
 - 47 1U Chassis
 - Custom RTM
 - Deployed in 2023
 - 3 production cycles with 1 hardware downtime
- Injection Kicker Waveform System
 - Deployed in 2 phases – 2018, 2021
 - 11 production cycles with 1 hardware downtime
 - Consolidated into one system – 2025



MicroTCA in Production at SNS – Personnel Protection System

- Beam Power Limiting System
 - Deployed and commissioned in 2025
 - 2 production cycles
 - No hardware issues
 - Fully Redundant
 - 2 Full chassis
 - Redundant supplies
 - Parallel ADC calculations



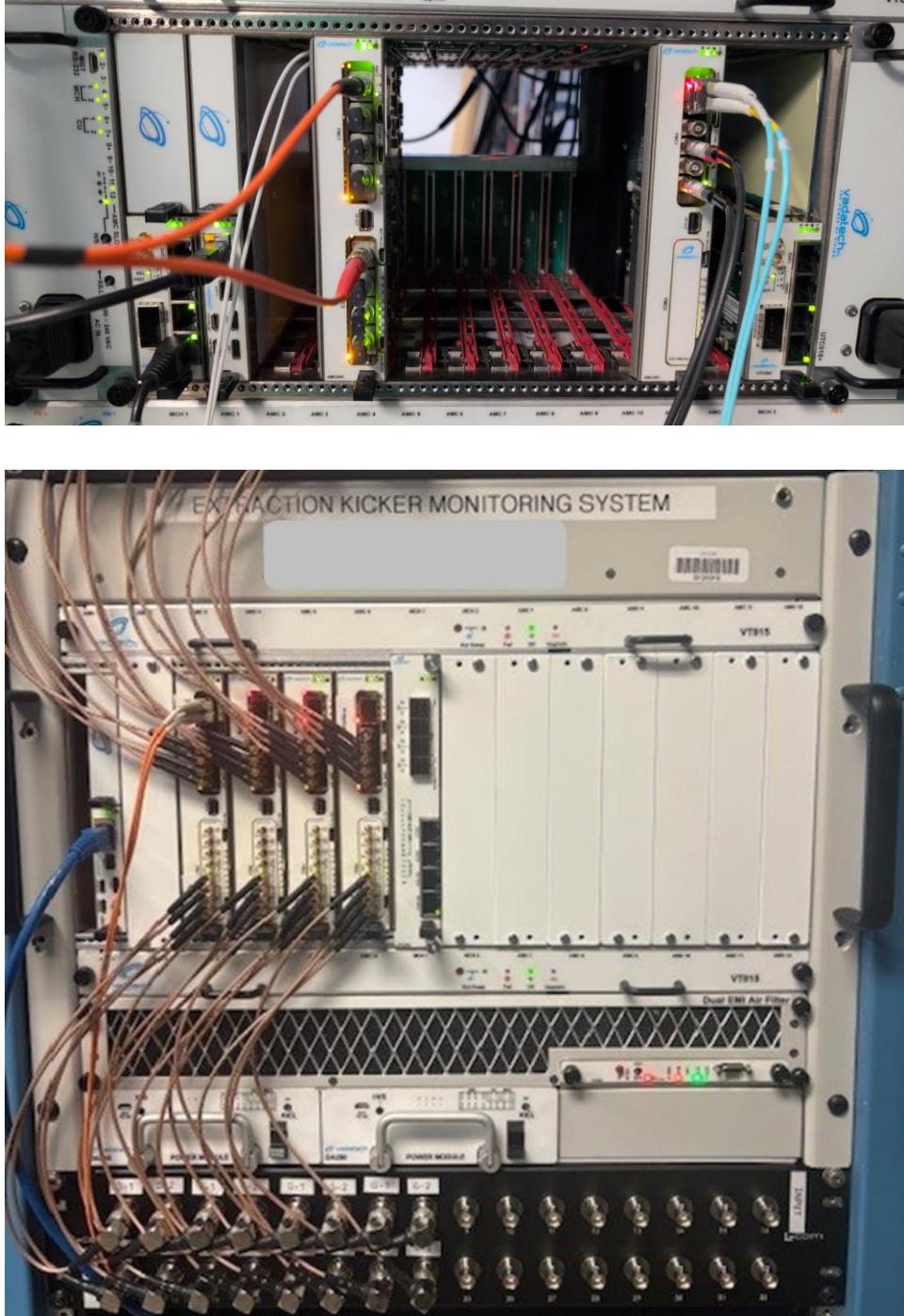
MicroTCA in Production at SNS – Low Level RF

- Ring LLRF
 - First MicroTCA Deployment at SNS
 - Deployed in 2016
 - 14 production cycles - 1 hardware downtime
- Superconducting LLRF
 - Deployed as part of our Proton Power Upgrade in 2024
 - 3 production cycles – 2 hardware downtime



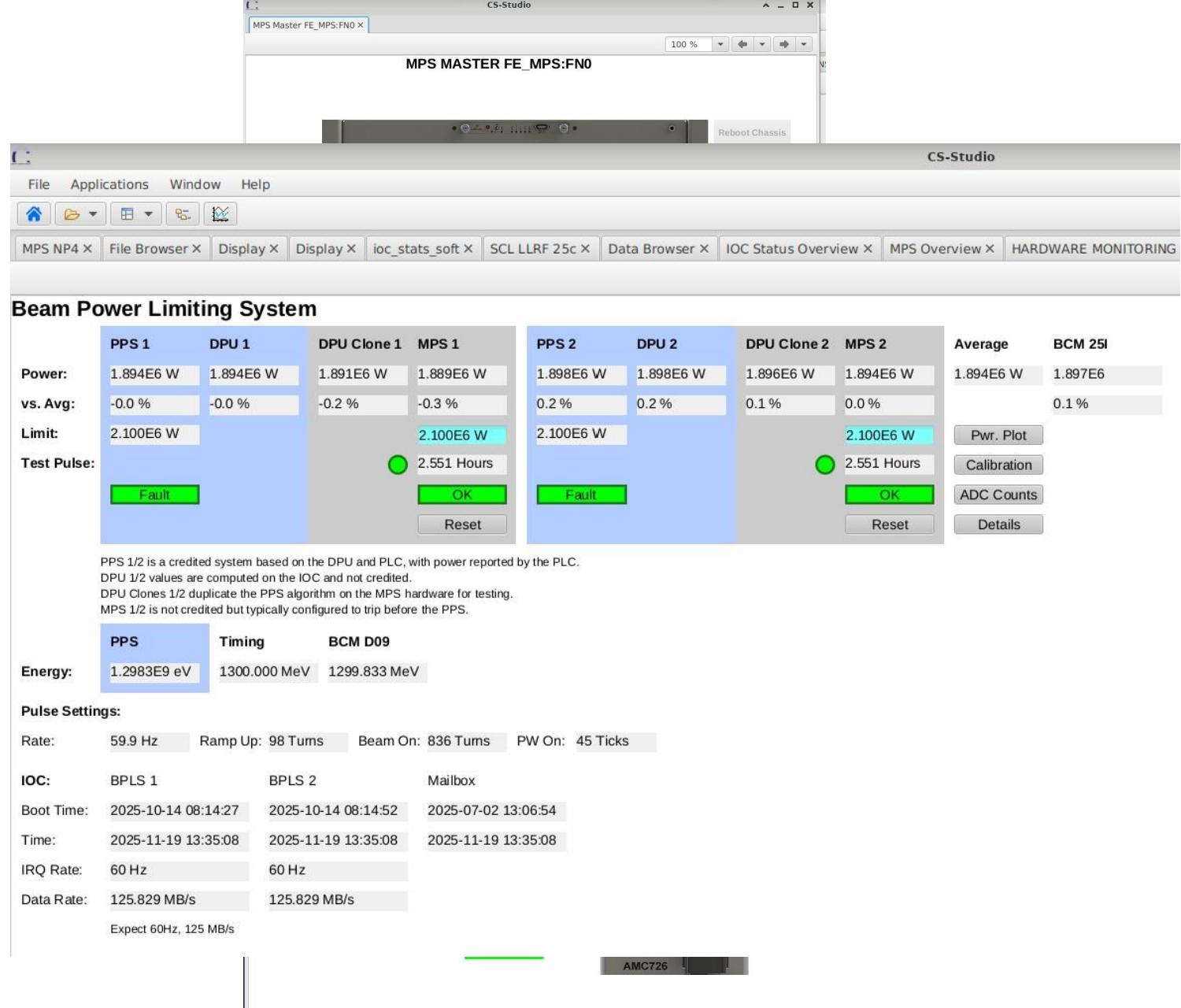
MicroTCA in Development at SNS

- High Power RF(HPRF)
 - Final Deployment will include 4 systems
 - Prototype testing starting March 2026
 - 1st Deployment in July 2026
- Extraction Kicker Waveform Monitoring
 - First phase deploying January 2026
 - Second phase deploying July 2026
- Normal Conducting LLRF
 - 4 CCL systems deploying in January 2026
 - 6 DTL systems deploying in July 2026
- Timing Master
 - Prototype will be finalized later in 2026



Software Integration

- IPMI
 - Based on IPMI Tool
 - In production for 3 cycles
 - Deployed on all MicroTCA systems
- EPICS integration
 - CSS-Phoebus
 - EPICS 7
 - Converting to PVAccess



EPICS Collaboration Meetings – MicroTCA Workshop Sessions

September 2024

April 2025





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