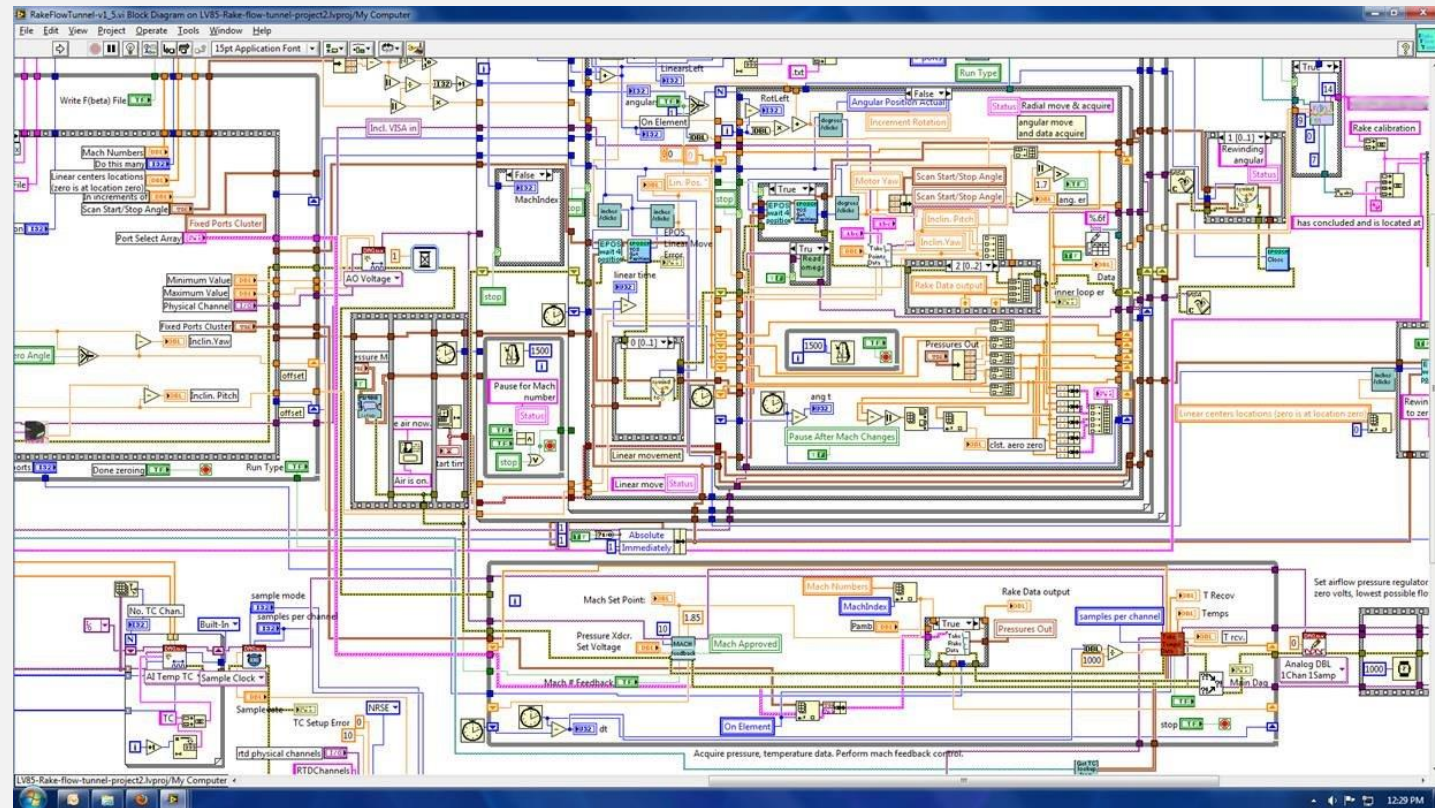# FURIOS EPICS LASER CONTROL SYSTEM

21.9.2018 EMIS 2018 Satelite meeting

MOTIVATION

EPICS

- **EPICS** is a set of Open Source software tools, libraries and applications :https://epics-controls.org/

- ~Good selection of hardware support modules: https://epics.anl.gov/modules/manufacturer.php

  - Example Motor module

  - Module for Serial communication

- Developing with EPICS base has somewhat steep learning curve

  - Installations may require some debugging

  - C language experience almost an requirement

- Interaction with a working EPIC IOC' extremely convenient

  - Command line tools

  - Python (PyEPICS, PcaSpy)

CONTROL SYSTEM

- EPICS modules used when possible
  - Motor module
    - PI, Agilis motors
  - Thorlabs powermeter module
    - P100 units
  - TDS Oscilloscope module
    - TDS300B
  - Serial module
    - Arduino
  - Wago module
    - Shutters

- PcaSpy used for EPICSfying other instruments(https://github.com/paulscherrerinstitute/pcaspy)
  - No need for C
  - Fast development

Examples
  - Wavemeter:
    - HighFinesse WS6, and WS10
  - DAQ
    - Ni 6009 USB
    - Measurement computing USB-CTR08
  - Motors
    - Micos

CONTROL SYSTEM

Hardware

- One DAQ Computer
  - Windows host
    - Wavemeter,
    - Counter units
  - Centos VM
    - Oscilloscope
    - Powermeter
    - WAGO
    - Serial communications

Software

- Motor scanning software
  - Single-motor control
    - Dual-etalon system TBD
  - Power meter readout
  - Counter readout
  - Oscilloscope remote readout
  - Wavemeter readout
    - Including mode structure
- Control software installable and usable from every computer in the network.

NEAR-FUTURE DEVELOPMENTS

- Remove last bits of Nationl Instruments legacy.

- Move rest of the EPICS IOC's to linux.

  - HighFinesse needs to be coerced to provide a Linux driver.

- Development

  - EPICS Motor module not optimal yet.

  - Add more features and debug PcaSpy- based driver interfaces.

  - Couple decay spectrocpy with laser system using EPICS.

  - https://gitlab.com/IGISOL for selected projects.