Experiment Control With Epics7 and Symmetric Multiprocessing on RTEMS (THP/IA154)
Heinz Junkes, Markus Heyde, Patrik Marschalik (Fritz-Haber-Institut, Berlin)

**Project CRYVISIL**
- To resolve glass dynamics
- Build up of a very high speed scanning tunneling microscope (STM)
- Integration of a commercial normal speed STM
- High sustained data rate (~ 3 Gbit/s for 5 hrs)

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Large atomically resolved STM image of the vitreous silica film revealing the Si positions

\[ V_S = 2 \text{ V}, \ I_T = 50 \text{ pA}, \]
Scan range = 12.2 nm x 6.6 nm
Recording Time > 10 min

**Waveform generator Highland V375**
4 independent direct digital synthesizer (DDS) frequenciesources allow smooth variation of waveform scan rates
Output frequency, amplitude, phase, and DC offset are smoothly variable in real time
EPICS/RTEMS 4.12 device support

**Digitizer Struck SIS3316**
16 channels, 250 MS/s per channel, 14-bit resolution, 64 MSamples memory/channel
Two programmable input ranges, 50 Ω or high impedance programmable, Offset DACs
125 MHz analog bandwidth, Internal/External clock
EPICS/RTEMS 4.12 device support

**VMEbus CPUs**
MVME6100 (beatnik) for control and compute runs CAS
MVME2500 for communication runs CAS and Psrv/Qsrv
full EPICS and RTEMS 4.12 device support

**References**
- RTEMS source builder: https://github.com/RTEMS/rtems-source-builder
- EPICS Areadetector: https://github.com/epics-modules; Control System Studio: https://github.com/ControlSystemStudio
- EPICS archiver appliance: https://slacmshankar.github.io/epicsarchiver_docs/