OAK RIDGE National Laboratory

Real-time visualization and fitting of dspace peaks at VULCAN instrument

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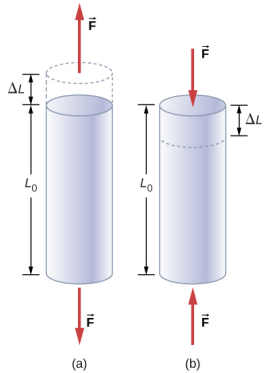
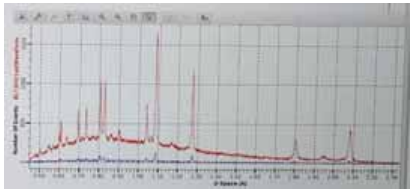
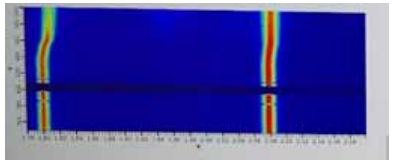
Real time peak fitting IOC

- IOC for realtime fitting of d-spacing plots of neutron source experiments (SNS and HFIR)
- Fitting parameters characterize physical properties (e.g. strain results in shift in peak's mean)
- Statistics on quality of peak fit for automating when to move to the next measurement
- Includes waterfall plot to show evolution of dspace over time







Implementation

- Actual peak-fitting done using scipy's optimize.curve_fit function
- Broadcasts result as PV so that any client can display results (e.g. Phoebus), or use them for feedback control (e.g. ScanServer)
- Implemented using PyDevice, which allows execution of python code from a real EPICS IOC. Real EPICS records (with standard fields), plus versatility of python.

Waterfall plot and peak fitting at VULCAN