Scan1D and Scan2D XAL Applications and Scan Package

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Outline

- **XAL Scan Applications Structure**
- **Scan1D**
- **Scan2D**
- **Scan Controllers**
  - **Scan1D**
  - **Scan2D**
- **Scan Analysis**
- **Conclusions**

XAL Scan Application Structure

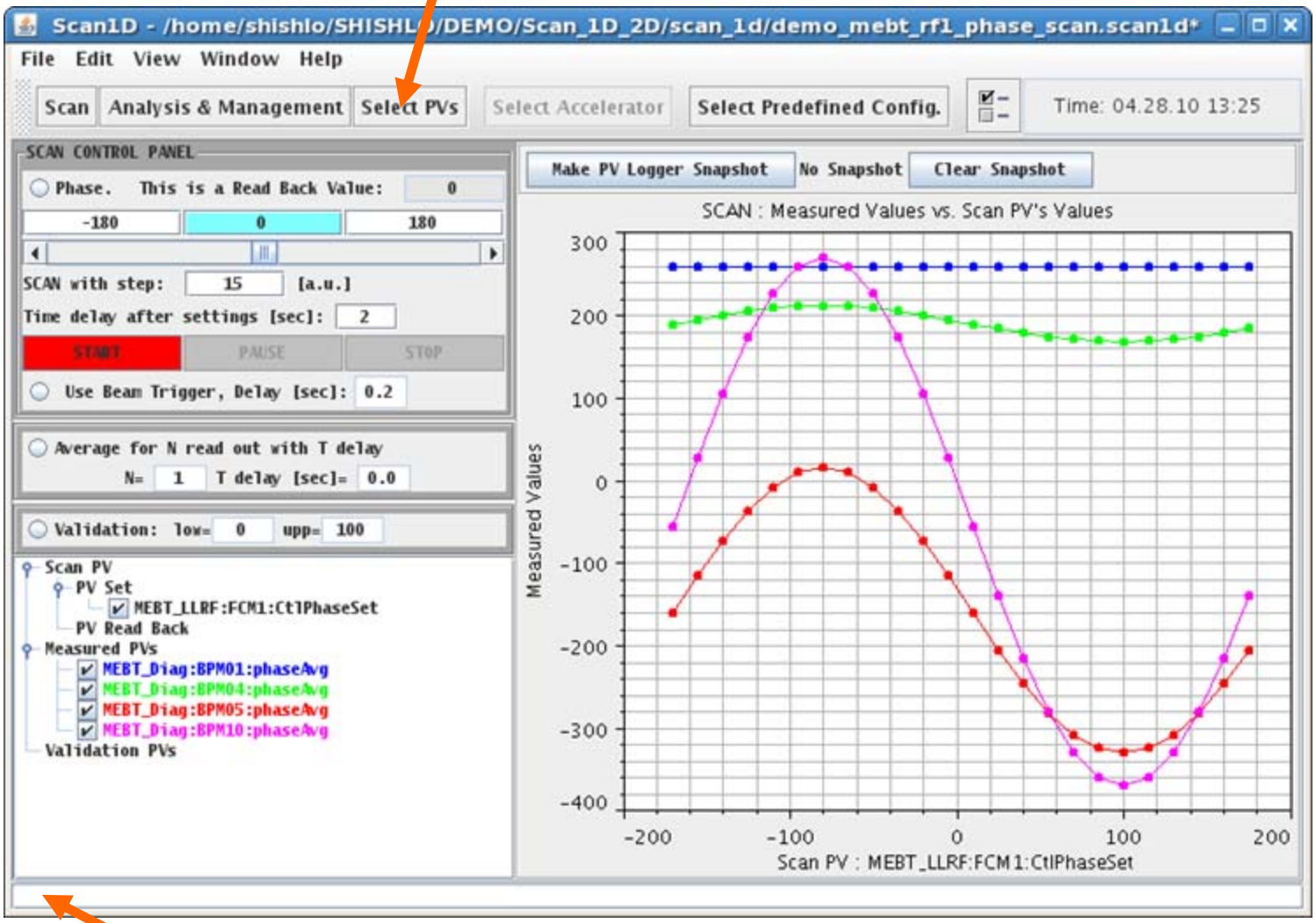
XAL Scan applications are used to measure a set of PV values against one (Scan1D) or two (Scan2D) PVs.

Components:

- **Set up (what to scan and how)**
- **Scanner**
- **Data management and control (bad points etc.)**
- **Analysis**
- **Auxiliary services (Save/restore etc.) are provided by XAL Application Framework**

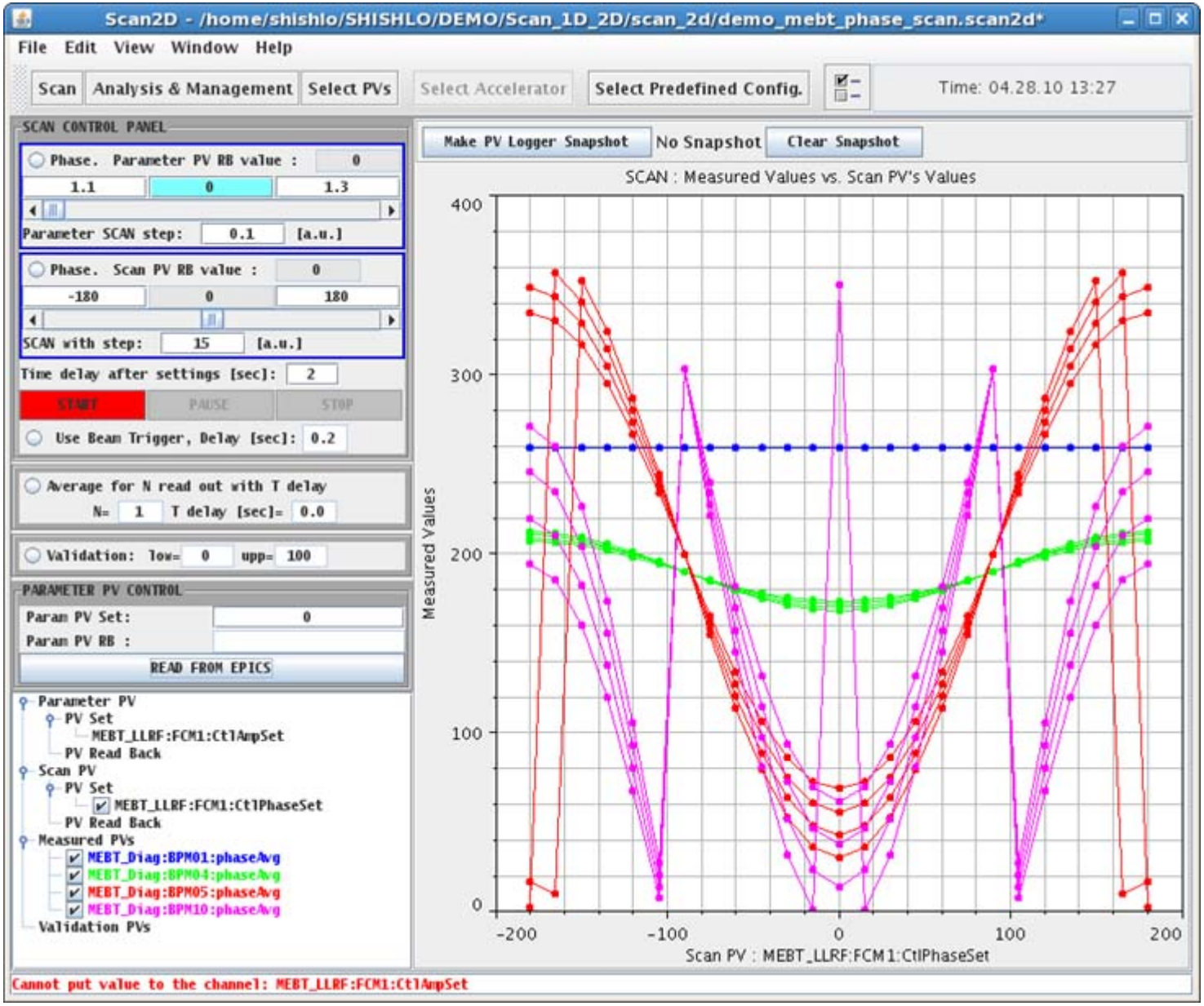
Scan1D

Set up PVs for scan



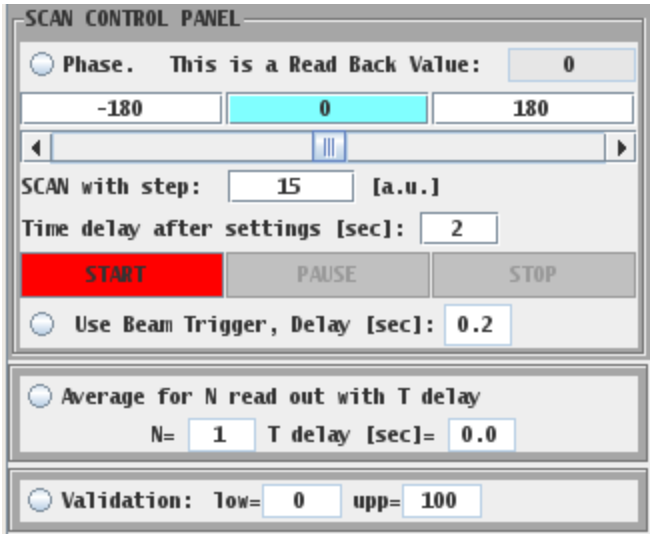
Message line

Scan2D



Scan1D Controller

Scanner Controller is a component of XAL Tools/Scan package.



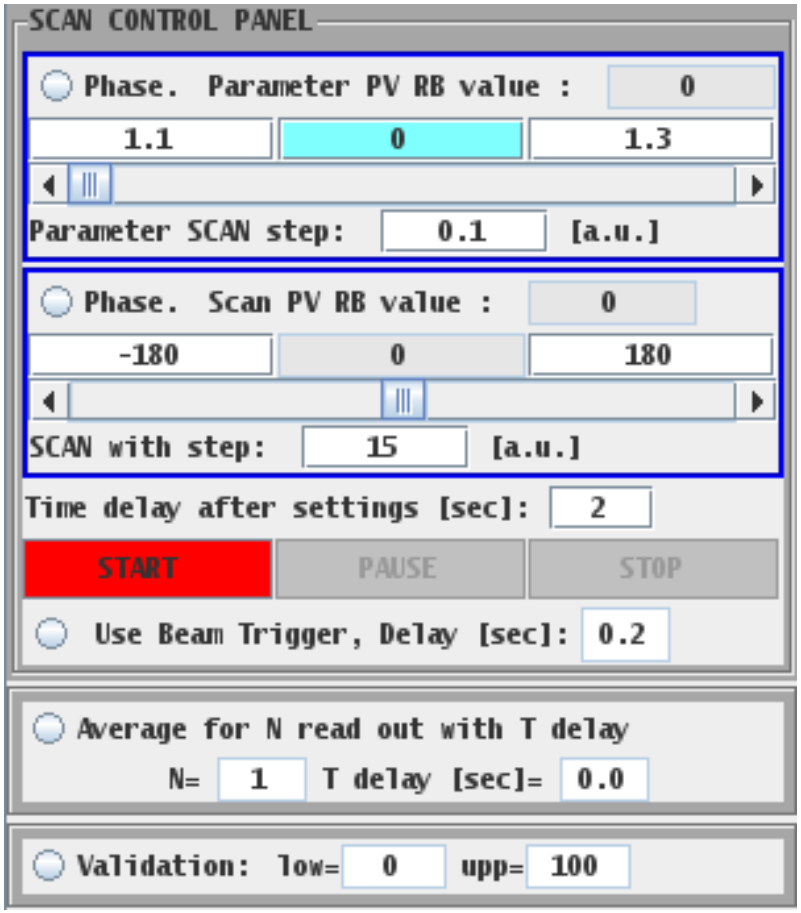
Scanner Controller has:

Averaging Controller

Validation Controller

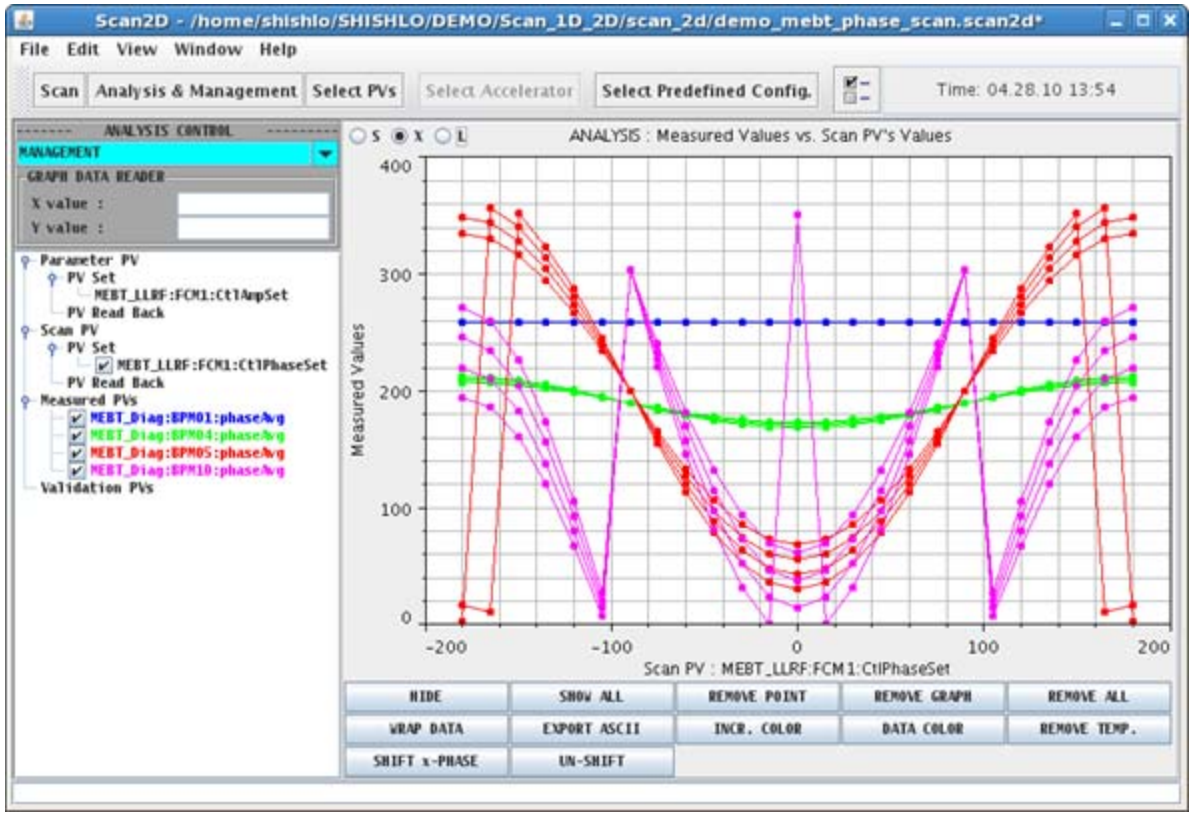
- Scanner Controller can be used in any application where the scan procedure is needed.
- User can implement and add to the controller the listeners for the scan start, stop, and a new data point generation events.

Scan2D Controller



It is similar to Scan1D, but it has two PVs to scan over:
The first we call a parameter PV, and the second is a scan PV.

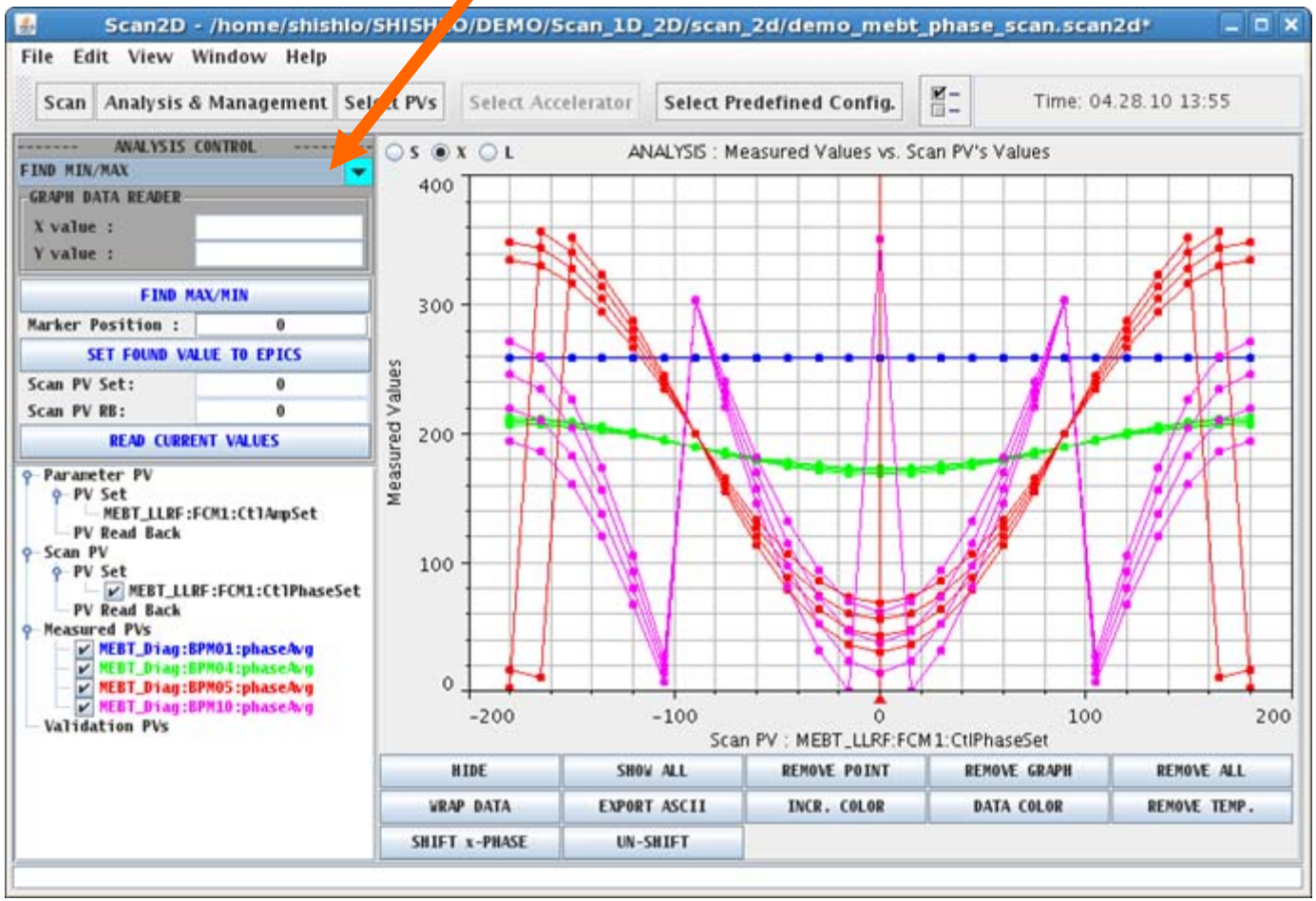
Data Management



Provides the user with ability

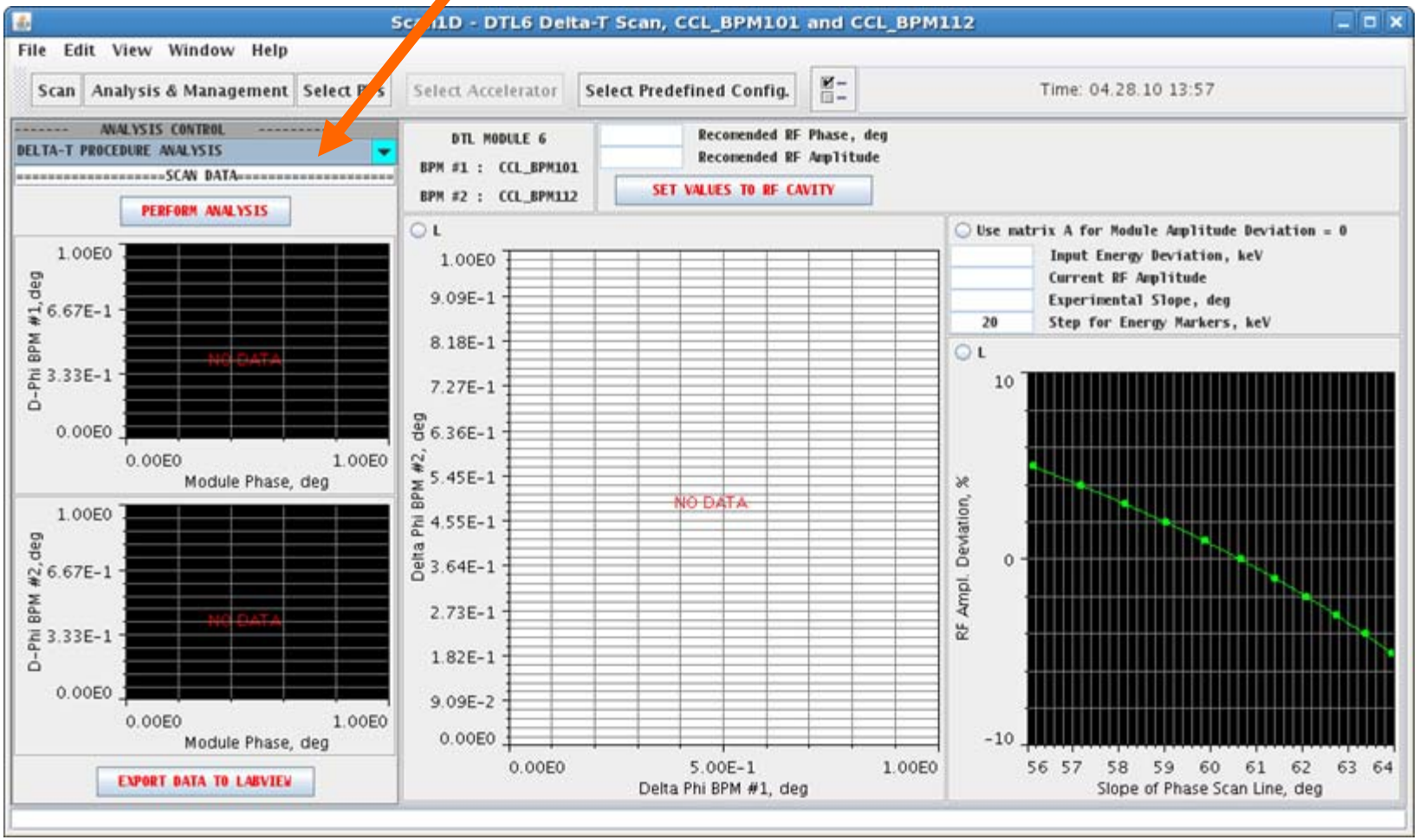
- Remove one point
- Remove one curve
- Wrap phase data
- Export data to ASCII file
- Phase shift/un-shift data

Analysis (General)



Custom Analysis

Delta-T procedure analysis



Save/Restore

- **The scan parameters and data can be saved in a special XML file.**
- **The scan application and data can be restored from this file.**
- **The set of available analysis is defined inside the XML file.**

```
<Scan1D_Application title="/home/shishlo/SHISHLO/DEMO/Scan_1D_2D/scan_1d/demo_mebt_rf1_phase_scan.scan1d">
    <app_params>
        <font name="Monospaced" size="10" style="1"/>
        <scan_panel_title title="SCAN CONTROL PANEL"/>
        <pv_logger_id Id="-1"/>
        <parameterPV_tree_name name="Parameter PV"/>
        <scanPV_tree_name name="Scan PV"/>
        <measuredPVs_tree_name name="Measured PVs"/>
        <validationPVs_tree_name name="Validation PVs"/>
        <UseTimeStamp yes="true"/>
        <limits_step_delay delay="2.0" low="-180.0" step="15.0" upp="180.0"/>
        <beam_trigger delay="0.2" on="false"/>
        <averaging N="1" delay="0.0" on="false"/>
        <validation low="0.0" on="false" upp="100.0"/>
    </app_params>
    <param_PV on="false" panel_title="PARAMETER PV CONTROL"/>
    <scan_PV>
        <PV name="MEBT_LLRF:FCM1:CtlPhaseSet" on="true"/>
    </scan_PV>
    <validation_PVs/>
    <ANALYSIS_CONFIGURATIONS>
        <MANAGEMENT>
            <ANALYSIS_NAME name="MANAGEMENT"/>
        </MANAGEMENT>
        <FIND_MIN_MAX>
            <ANALYSIS_NAME name="FIND MIN/MAX"/>
        </FIND_MIN_MAX>
        <POLYNOMIAL_FITTING>
            <ANALYSIS_NAME name="POLYNOMIAL FITTING"/>
        </POLYNOMIAL_FITTING>
        <INTERSECTION_FINDING>
            <ANALYSIS_NAME name="FIND INTERSECTION"/>
```

Conclusions

- **XAL includes two general scan applications**
- **A user can create a custom analysis for particular purpose**
- **The scan package classes can be used everywhere to provide a scan capability in an application.**