XAL Implementation of DTL Acceptance Scan and Analysis

July 8, 2005

Outline

- DTL Acceptance Scan
- Analysis. The Case of One Amplitude Value
- Analysis. Multiple Scans (for Several Amplitudes)
- Possible Problems
- Conclusions

DTL Acceptance Scan

Multiple Scan Plan

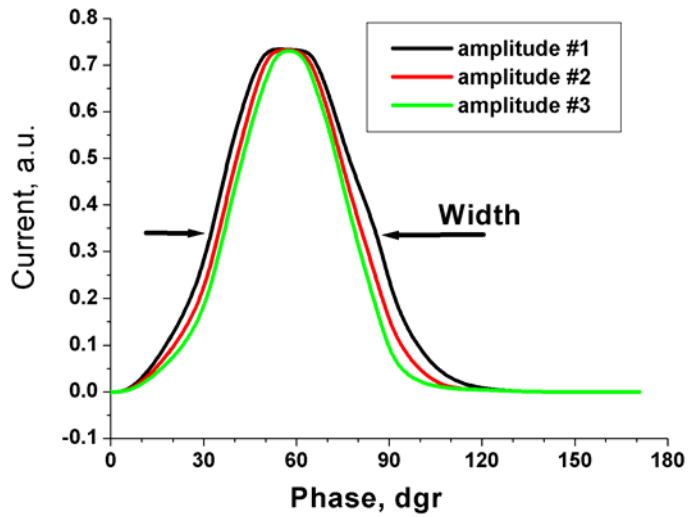
1 Set DTL Amplitude

1.1 Scan over Phase measuring Faraday Cup current

1.2 Repeat Point #1 with different amplitude

All others DTL modules between this DTL module and the Faraday Cup should be switched off

Scan Results

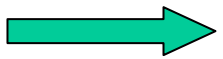


Analysis. The Case of one Amplitude Value.

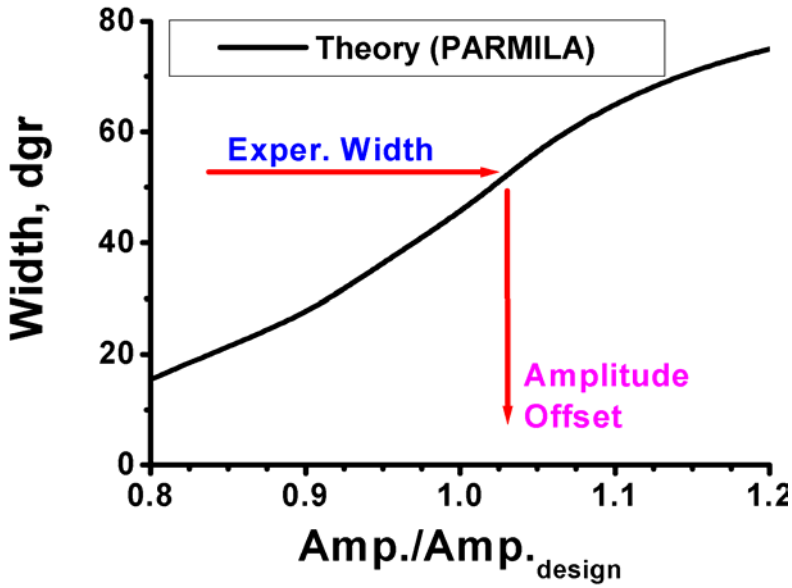
The analysis is always based on comparing theoretical results and scan.

The PARMILA code has been used for theoretical predictions (Sasha Alexandrov) .

We have one scan for particular amplitude a_{res} in arbitrary units



We have w_{res}(the graph width) after scan graph analysis

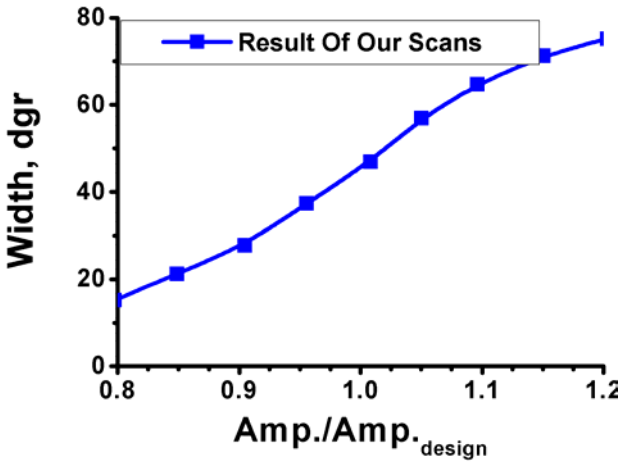


If we know the amplitude offset we can find the design amplitude

Analysis. Multiple Scans (for Several Amplitudes).

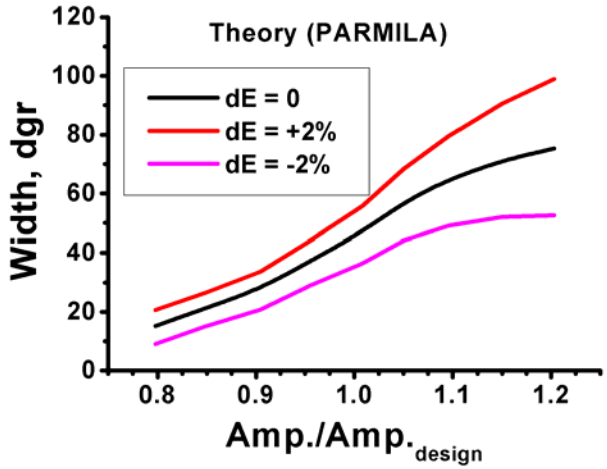
After scans we have

Width vs. Amplitude



The PARMILA Runs

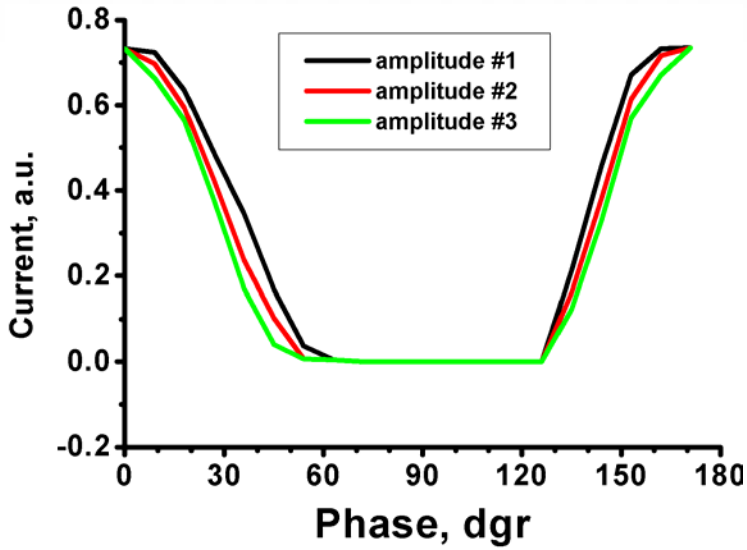
For different Energy deviations



Comparison gives us

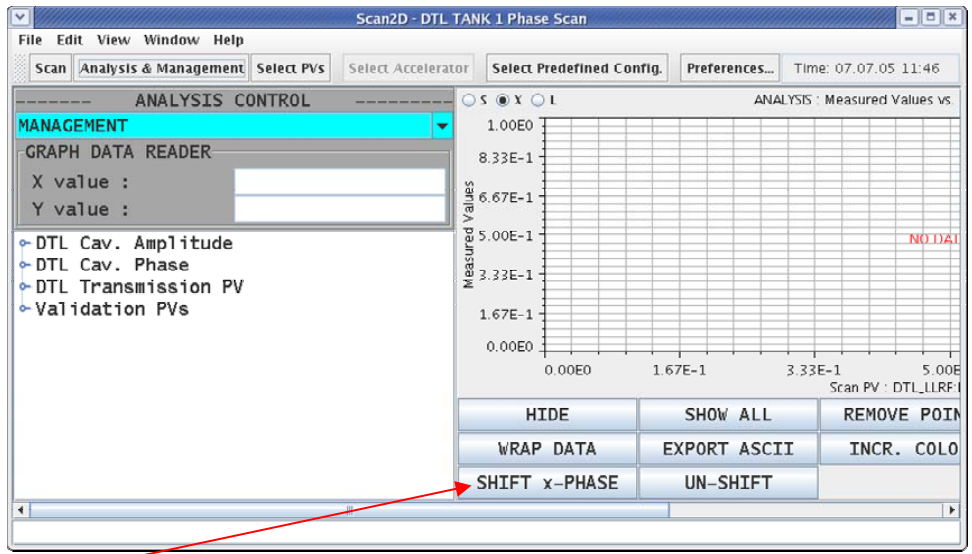
- The design amplitude
- The energy deviation from design energy

Possible Problems



The design phase is near to 0 or 180 degrees

How to find the Width?



Answer:

Use "SHIFT x-PHASE" Button In the Scan1D and Scan2D XAL Applications during the analysis

Conclusion

Both XAL-applications

- Scan1D
- Scan2D

can be used for the DTL Acceptance Scans through the predefined configuration mechanism.