Wall Angle

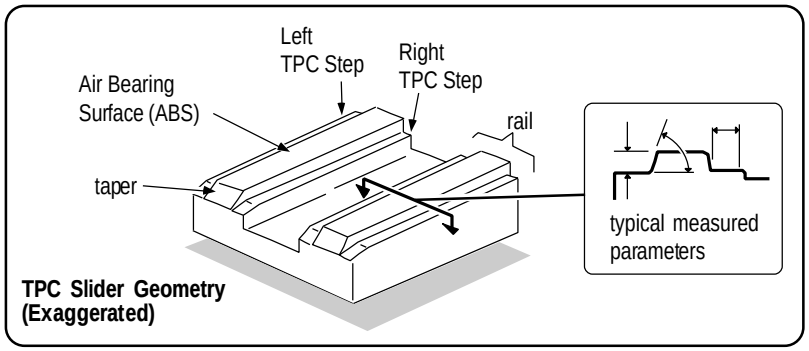
OMP-0371B

MetroPro Application

This booklet is a quick reference; it assumes that you are familiar with MetroPro™ and the instrument. Information on MetroPro is provided in *Getting Started With MetroPro*, OMP-0346 or OMP-0398, and the *MetroPro Reference Guide*, OMP-0347. For information on the instrument, please refer to the Zygo manual(s) included with your instrument.

The Wall Angle Application

The MetroPro Wall Angle Application is specifically designed to measure Transverse Pressure Contour (TPC) sliders with single steps, such as those shown in the drawing below. It provides comprehensive test results on the width of the stepped areas and the angle of the wall between the ABS and the steps. The Wall Angle Application requires a 10X Mirau objective and can examine one rail with steps.



The Wall Angle Application is for use with the Zygo NewView microscope. The application requires licensing to take measurements or load data. It is licensed as a separate line item in the Edit/View Licenses window. For information on licensing, see the *Getting Started With MetroPro* manual.

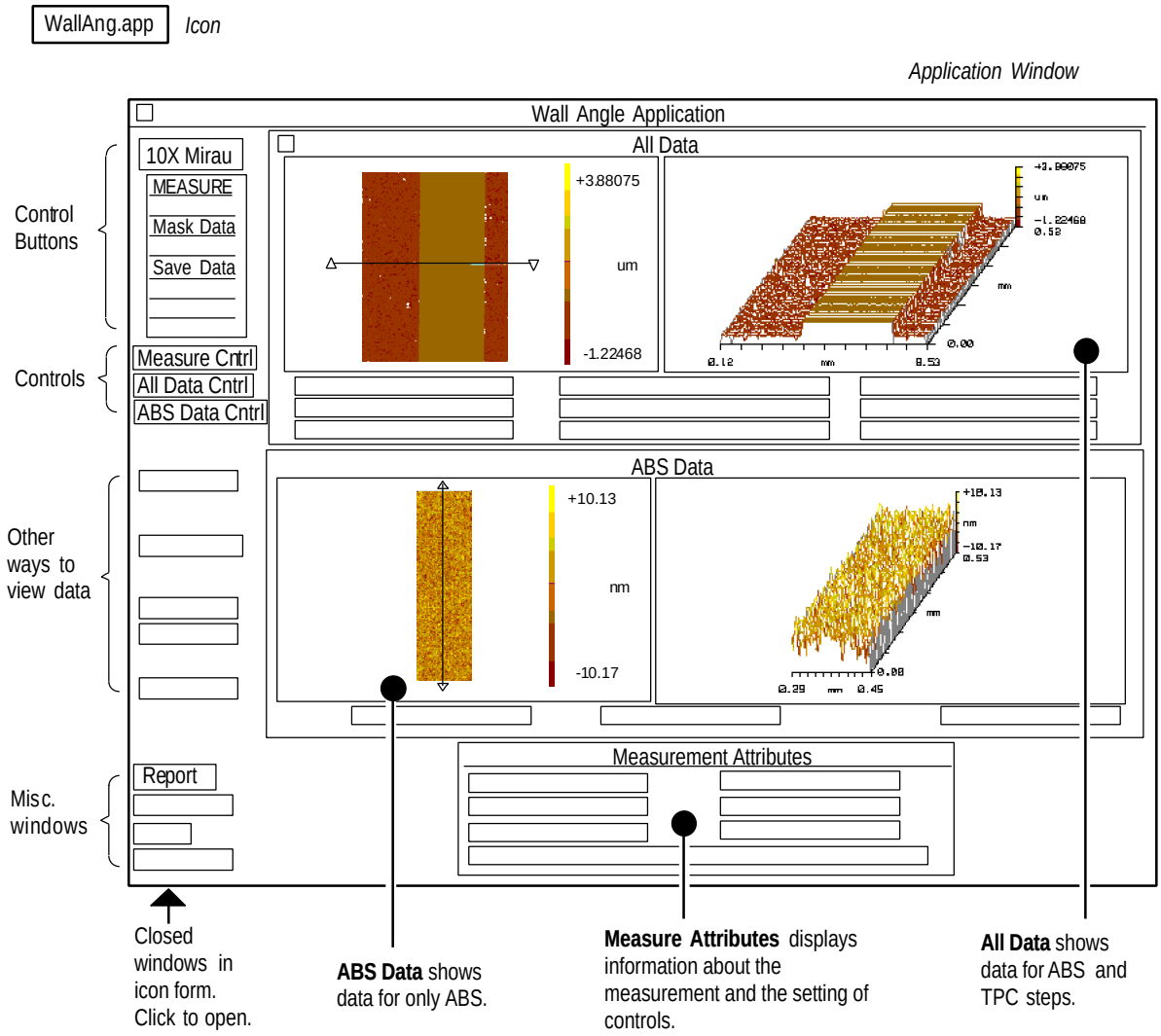
The Wall Angle Application:

- Automatically locates the measurement area.
- Measures the angle of the wall between the ABS and the TPC steps.
- Measures the height between the ABS and each step.
- Displays graphic views of one rail and the ABS alone.
- Provides optional profile views.

Other Zygo applications, related to hard disk drives, are available to measure TPC head geometry, pole tip recession (PTR), and 2 and 3 rail ABS geometry.

The Application Screen

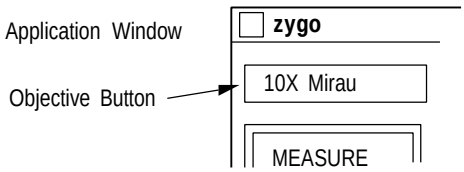
To open the application, click on the icon. If the icon is not loaded unto the MetroPro base window, then use the Load Application command from the MetroPro Window menu to first load the application icon.



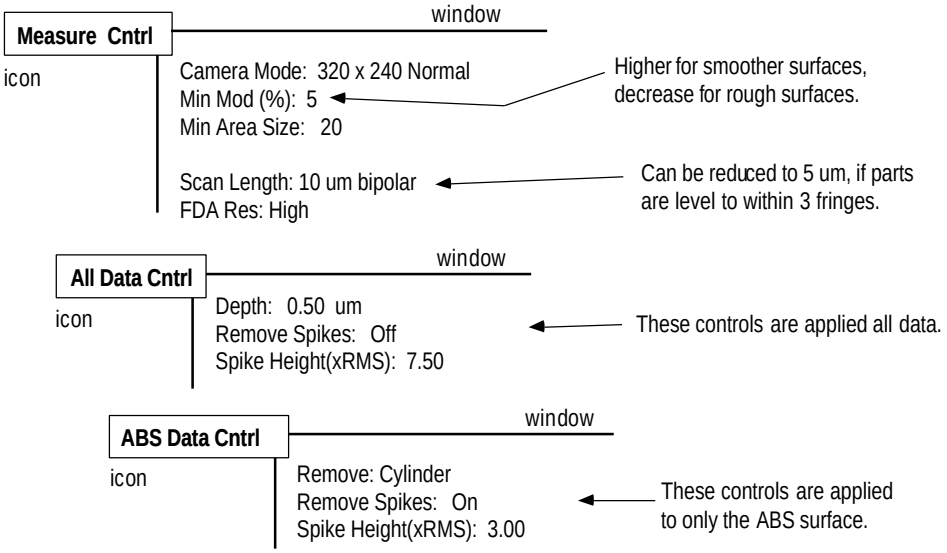
Setup

1. Use the 10X Mirau objective for 70% sliders. It is recommended that you create a system reference file for the objective and then subtract this file from the measurement. For more information, see the *Microscope System Error Application* booklet, OMP-0361.

2. Click on the Objective button until it displays the objective in use.

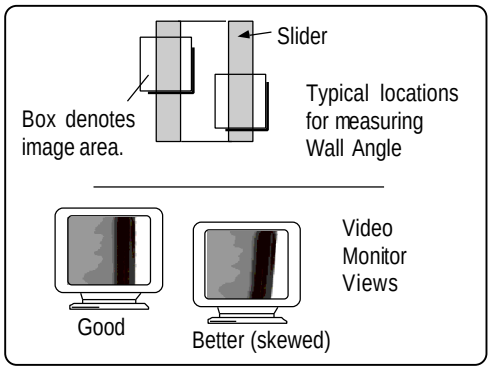


3. Starting point for software Controls:



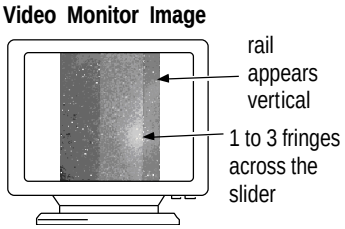
4. Place sliders on the support stage under the objective. Orient sliders so they appear vertical on the video monitor. Locate the slider so that one rail is in view as shown below.

5. For best repeatability, *do not* align the rail edge perfectly with the y-axis. Slight variation in alignment will help cancel possible aliasing effects.



Making Measurements

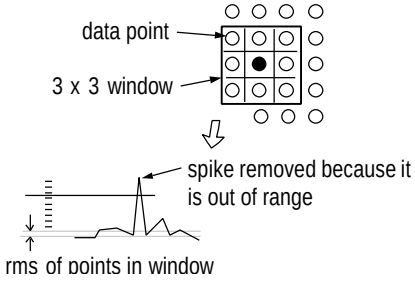
1. Adjust the instrument for focus and the stage tip/tilt for from 1 to 3 visible fringes across the slider.
2. Press **F5** to adjust the instrument light level.
3. Press **F1** to measure.

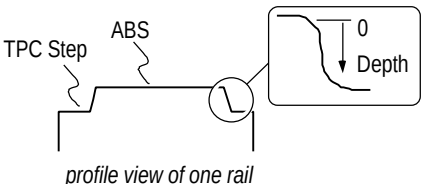


Wall Angle Controls

Controls of special interest for the Wall Angle Application are listed below. Other controls are explained in the *MetroPro Reference Guide*.

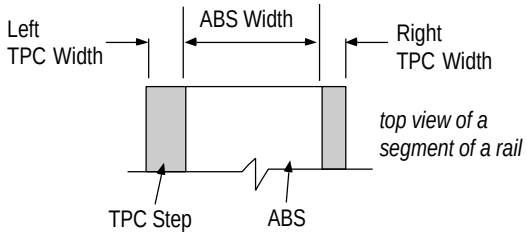
Control	*Function*
Remove Spikes	Determines if spikes are removed from the data. When On, a 3 x 3 windowing function uses the setting of the Spike Height control to remove spikes from the data. Spikes can be removed from just the ABS or all data.
Spike Height (xRMS)	When Remove Spikes is On, it removes spikes from the data that are above the entered value times the RMS in the 3 x 3 window. Single data points higher than the spike height are removed. Default value is 7.50 for All Data and 3.00 for ABS Data.
Depth	Specifies the distance from the top of the ABS down. This data is used to calculate wall angle. Generally, set depth to 1/2 to 3/4 of the nominal step height.
Min Mod (%)	Specifies the minimum modulation necessary for a valid data point. Decrease to accept areas with poor fringe contrast or low reflectivity. Increase to exclude unwanted data points.
Min Area Size	Specifies the number of data points in a valid region. Decrease to accept smaller areas. Increase to accept larger areas and reject smaller.

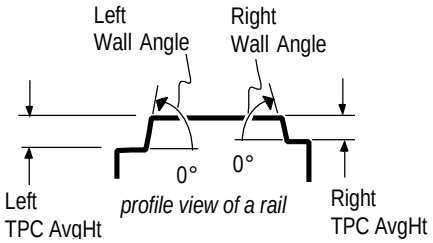




Wall Angle Results

Wall Angle results are explained below. Use the drawing as a reference. For results not listed, refer to the *MetroPro Reference Guide*.





Result	*Description*
Left TPC Width	The dimension across the TPC step to the left of the ABS.
Left TPC AvgHt	The average height between a plane fit to the ABS and a plane fit to TPC step to the left of the ABS.
Left Wall Angle	The angle of the wall between the left TPC step and the ABS.
Right TPC Width	The dimension across the TPC step to the right of the ABS.
Right TPC AvgHt	The average height between a plane fit to the ABS and a plane fit to TPC step to the right of the ABS.
Right Wall Angle	The angle of the wall between the right TPC step and the ABS.
TPC AvgHt	The average height between a plane fit to the ABS and a plane fit to both TPC steps.
ABS Width	The dimension across the ABS.
PV	The height between the lowest and the highest point on the ABS.
rms	The root-mean-square deviation of all points from a plane fit to the ABS.
Ra	The average roughness, or the average deviation of all points from a plane fit to the ABS.

Other Operations

Operation	*How to*
Save data	Click the Save Data button. In the File Handler, enter a name for the file, ending with ".dat", then click Done.
Print results	Click the word "zygo" in the window you want to print or select the Print command from the window's menu. In the Print Panel, click the Print button.
Save changes made to controls, plots, results, and windows	You must save the application under a new name. Select the Save Application command from the Application Window menu. In the File Handler, enter a name for the file, ending with ".app" and click the Done button.
Use an Acquisition mask	Click the Mask Data button. Use the Mask Editor to define areas to include or exclude from the test part measurement. Define as an Acquisition mask to increase processing speed. Do not use Test or Reference masks with the Wall Angle application. See "Mask Editor" in the *MetroPro Reference Guide*.
Turn off the system	**Warning!** *Improper shutdown may damage the instrument.* For instruments running under UNIX, select the Shutdown command from the MetroPro menu; turn off power after the system halted message appears. For instruments running under Windows, select the Quit command from the MetroPro menu; turn off power after you have shut down from within Windows.

Troubleshooting

Symptom	*Possible Cause and Fix*
Application not functional.	The application is not licensed. The Wall Angle Application requires a separate license; contact Zygo for licensing information.
No data error or graphic displays appear incomplete or with holes.	The instrument is not properly focused or the fringes are not nulled. Focus the instrument and null the fringes. The Min Mod (%) control is set too high; decrease the value. NewView scan length may be too short. Increase length with Scan Length control.
Poor repeatability of results.	Parts moving during measurement. Check the support stage and fixturing. Head trays should fit tightly and contact the fixture. Noisy environment. Look at the video monitor for fringe drift or vibration; these signs indicate a noisy environment. Check for air drafts; ensure that the computer is not contributing noise to the vibration isolation system.

zygo

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OMP-0371B 7/96
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