



Q:

What resolution and accuracy will I achieve with the OS1 Autocollimator?

A:

Optical resolution

The camera pixel size is exactly 7.4 microns, and the objective lens focal length is 200 mm. Thus each pixel represents 37 micro-radians of arc¹.

Maximum resolution with PixelScope Lite software

PixelScope lite software is included with the OS1. This software allows viewing the camera output on a computer monitor, but does not have measurement capability per-se.

Maximum resolution with PixelScope Pro software

PixelScope Pro software is available directly from Wells Research and Development. This software includes sophisticated sub-pixel interpolation capability. The measurement tools in PS-Pro offer solid performance to the 1/10 pixel level or about 3 micro-radians optical (the resolution is far greater than 1/10 pixel).

PixelScope-Pro also has the ability to measure position and plot the results in real time. For more information on PixelScope Pro, or to download an evaluation copy of the software please visit <http://www.wellsresearch.com/software.php>.

Measurement linearity

The spacing of pixels on the Sony CCD is determined by the semiconductor fabrication process. It is extremely accurate, and large-scale linearity is exceptionally good. The interpolation algorithm is also very accurate². Measurement errors due to vibration, air-path noise, and camera noise are almost always far larger than linearity errors.

¹ When measuring mechanical tip the sensitivity is doubled. One pixel represents 18.5 micro-radians of mirror tip.

² Measured linearity is better than 1/100 pixel for a typical target.