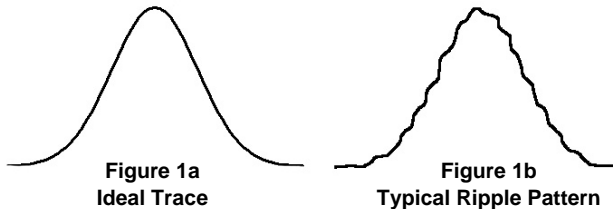


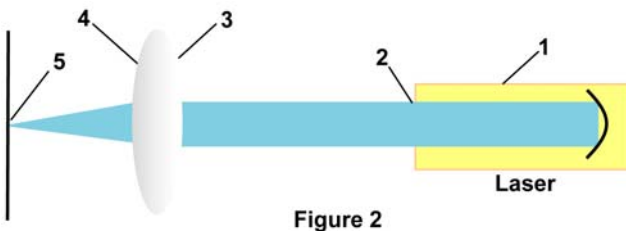
Technical Note

NanoScan and Coherent Light

When profiling a coherent laser beam with a NanoScan with non-blackened, reflective apertures (slit or pinhole), it is possible that interference may be observed on the beam trace. (see Figure 1b).



The interference is due to back reflections from the slit/pinhole. Even a blackened slit/pinhole can cause this effect, because the air slit/pinhole edges appear as a point source. Figure 2 illustrates the setup.



Slit surfaces and slit edge (5) reflects light that interferes with reflections from surfaces (2), (3), and (4). When the slit is in the exact focal plane and perfectly aligned, the configuration is like an interferometer. The interference can be reduced or eliminated as shown in Figure 3.



Note that the lens has been displaced from the center with reflections never crossing each other. (This is a practical solution sometimes, but not always.)

The reflection can be directed out of the system by scanning the image at a slight angle (see Figure 4). One must then correct the measured beam size by multiplying the measured beam size by the cosine of the angle of tilt. If the tilt is 10°, $\cos 10^\circ = 0.985$ actual beam size.

