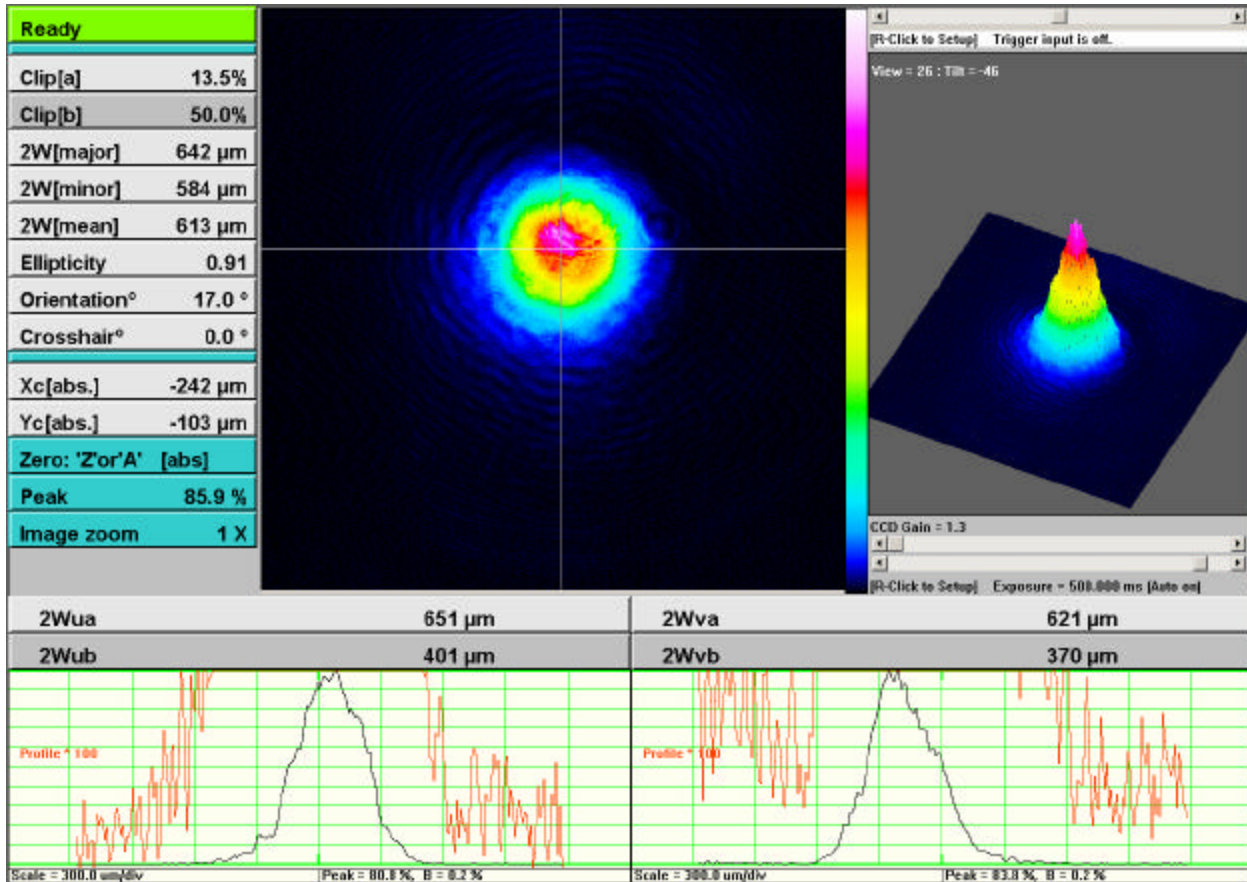


Questions are asked about the intrinsic SNR of WinCamD. It is ~1000:1. This number is derived as follows.

Select **File, Load defaults** to reset the camera defaults. Take a beam image with the camera on auto-exposure. The beam should have a diameter less than 1 mm so that there is a wide zero level. [There must be a beam, or the auto-gain in the software will simply magnify the noise.] Use the **Enter Intensity Multiplier** and enter **100** to multiply the profile by 100.



This will show an orange profile with a peak-to-peak noise of around 50%. Dividing this by the 100 factor entered earlier and the peak-to-peak noise is calculated at 0.5% of the signal. Since SNR conventionally refers to Signal to RMS noise, and since peak-to-peak Gaussian random noise is typically 5 to 6 times the RMS noise, the RMS noise is therefore 0.1% of the signal peak.

1,000:1 may also be expressed as 30dB optical SNR, [60dB Electrical]. A 10-bit ADC has 1024 sample levels, so to sample the RMS noise properly (without quantization effects) requires at least an 11 or 12 bit ADC. That is why we use a 14-bit ADC.