

10.11.2005

Measurement of a HeNe laser at 632,8nm

Laser Specifications:

Manufacturer	LINOS (Spindler & Hoyer)
Model number	30-1 (1993)
Product Number	04 0611
Serial Number	93184
Output	1mW
Beam Diameter	0,60mm (1/e ²)
Divergence	1,3mrad

Sensor / Camera Specifications:

Sensor	2/3 " CCD
Pixel number	1392 x 1040
Pixel size	6.45 µm
Sensor Size	8.97 x 6.71 mm ²
Frame rate	15 fps
Dynamic	12 Bit

Test set-up:

The laser beam is targeted directly onto the ML3721 Metrolux camera. A N/D filter with an optical density of 4.0 is placed in front of the laser, the distance between laser and CCD sensor is 55mm.

Before the measurement was started, a background correction was made.

A region of interest was placed around the laser spot.

The calculated laser beam diameter at a distance of 55mm in front of the laser is:

$$0,60 \text{ mm} + 2 * (0,0013/2) * 55\text{mm} =$$

$$0.60\text{mm} + 0.072\text{mm} = 0.672\text{mm} = 672\mu\text{m}$$

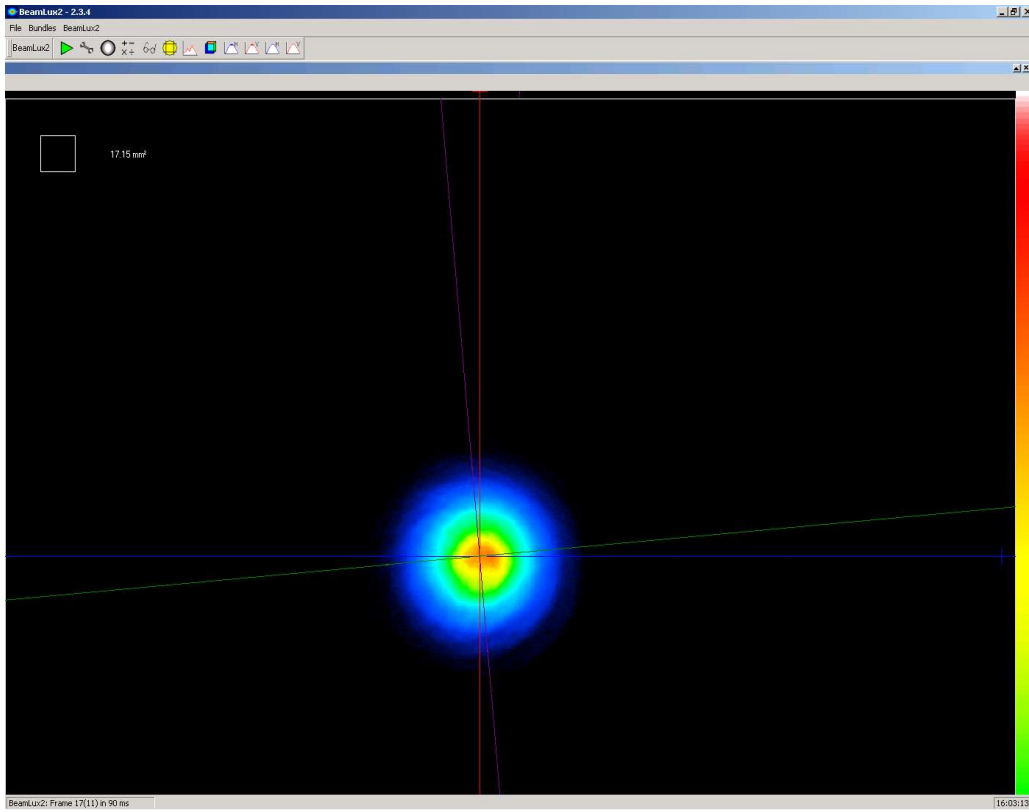
Results of the Laser beam profiler software BeamLux II

- a) 2D image
- b) 3D image
- c) 1D cross section horizontal and vertical
- d) evaluation results

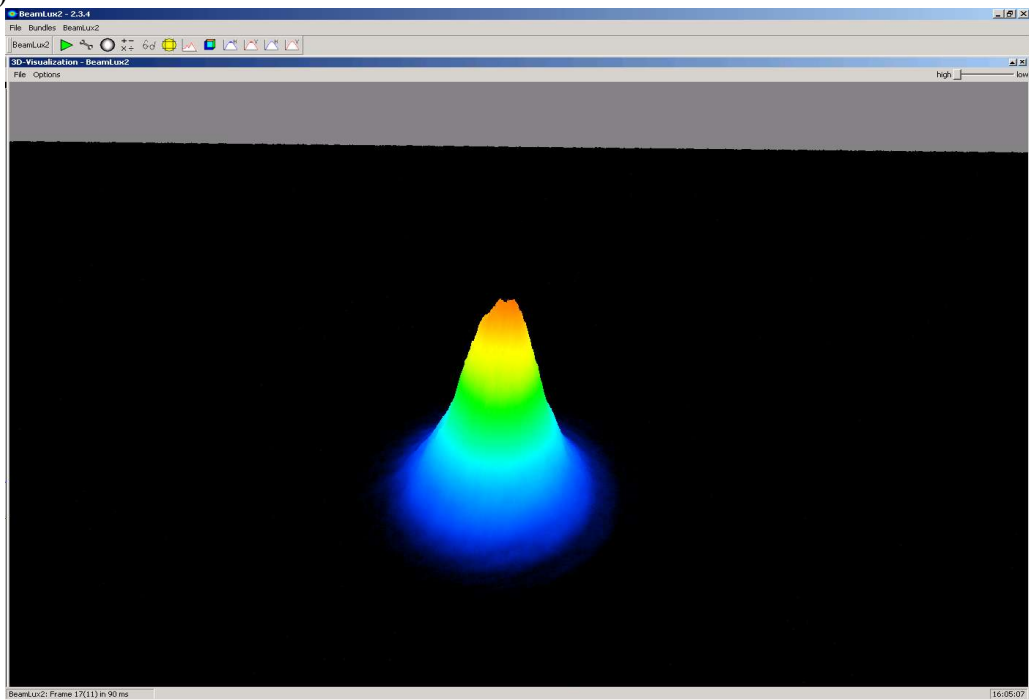
All three different methods for evaluation of laser beam diameters are used as moving slit, knife edge and 2nd moment. Due to the good background correction all values are equal:

	Current value	Average	#	+/-
2 nd moment X	675μm	668μm	51	-0.6%
2 nd moment y	671μm	665μm	51	-1,0%
Knife edge X	663μm	660μm	51	-1,8%
Knife edge Y	674μm	661μm	51	-1,6%
Moving slit X	668μm	664μm	51	-1,2%
Moving slit Y	662μm	659μm	51	-1,9%

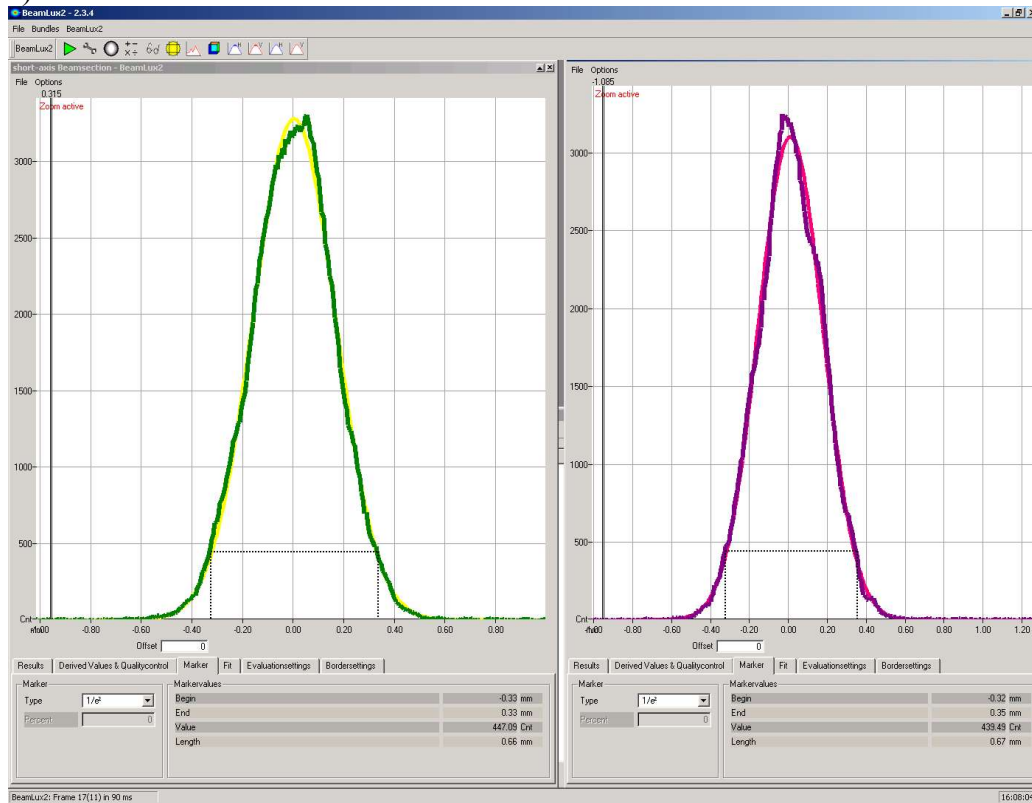
a)



b)



c)



d)

BeamLux2 - 2.3.4

File Bundles BeamLux2

BeamLux2

Display - BeamLux2

File Options

Name	Value	Average	N
Beam width (second moment) (major axis)	675 μm	668 μm	51
Beam width (second moment) (minor axis)	671 μm	665 μm	51
Beam width (knife-edge, beam coordinates) (major axis)	663 μm	660 μm	51
Beam width (knife-edge, beam coordinates) (minor axis)	674 μm	661 μm	51
Beam width (slit, beam coordinates) (major axis)	668 μm	664 μm	51
Beam width (slit, beam coordinates) (minor axis)	662 μm	659 μm	51

BeamLux2: Frame 59(51) in 180 ms

16:11:49