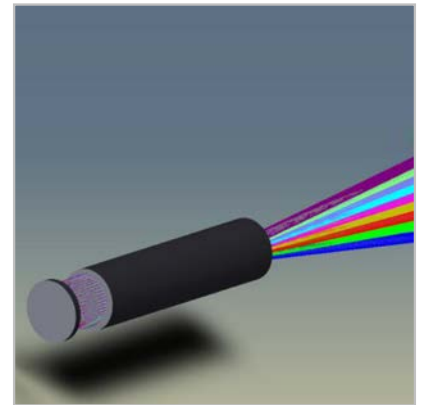


DOE BEAM Expander

The new BEAM Expander specifically designed for DOE applications, reduces or expands the full angle of a DOE output by a magnification factor.

Unlike standard beam expander, this module takes into considerations the characteristics of beam shaping, beam splitting and beam foci elements, thus achieving good results with minimal aberrations.

Custom specific modules can be supplied on custom request.



Specifications

Material:	Fused Silica
Transmission:	$\geq 97\%$
Fixed expansion factor:	x5 and x9.4
Product categories to be used with the DOE expander:	Beam Splitter, Homogenizer / Diffuser, Top-Hat Beam Shaper, Vortex Spiral Phase Plate, Diffractive Axicon, Multi-Circles
DOE expander optimized for:	Square shape beam (as Top-Hat square or Beam Splitter 2D square [9x9 spots for example])
Suitable for:	266nm to 1550nm

Typical Set-up

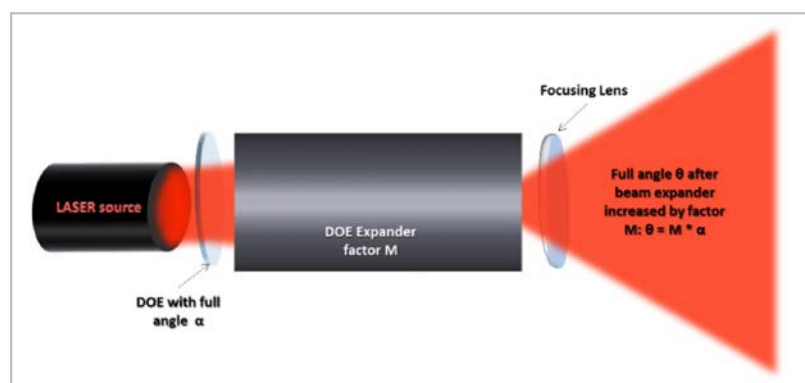
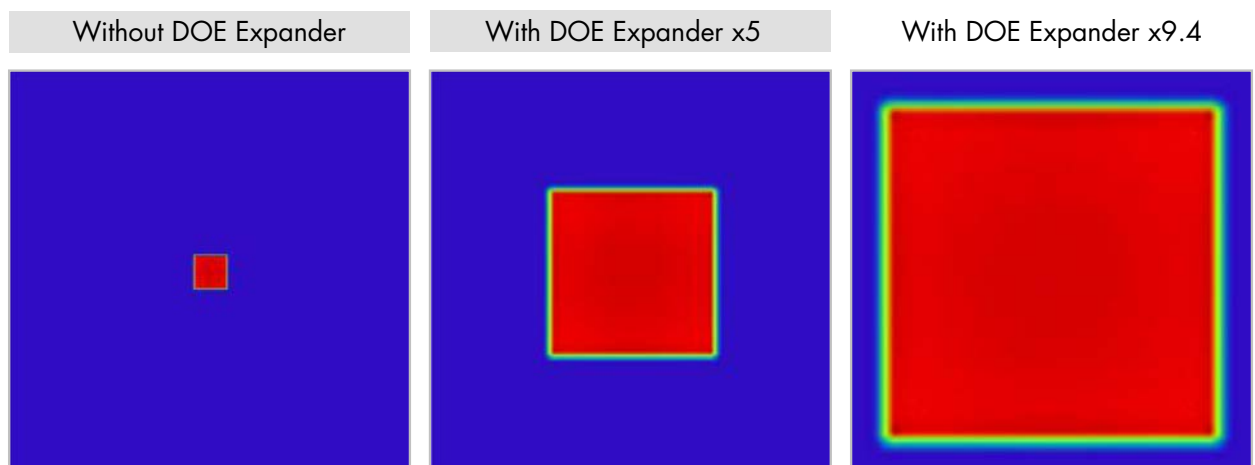


Table Parameters of DOE Expanders

Part Number	Magnification	Max entrance and exit aperture (mm)	Max input beam (mm)	Max input angle (deg)	Module length*	Outer diameter
DOE_Expander_x10	x9.4	23	14	3	130	35
DOE_Expander_x5	x5	23	14	3	110	35

*: not including the DOE and optional focusing lens

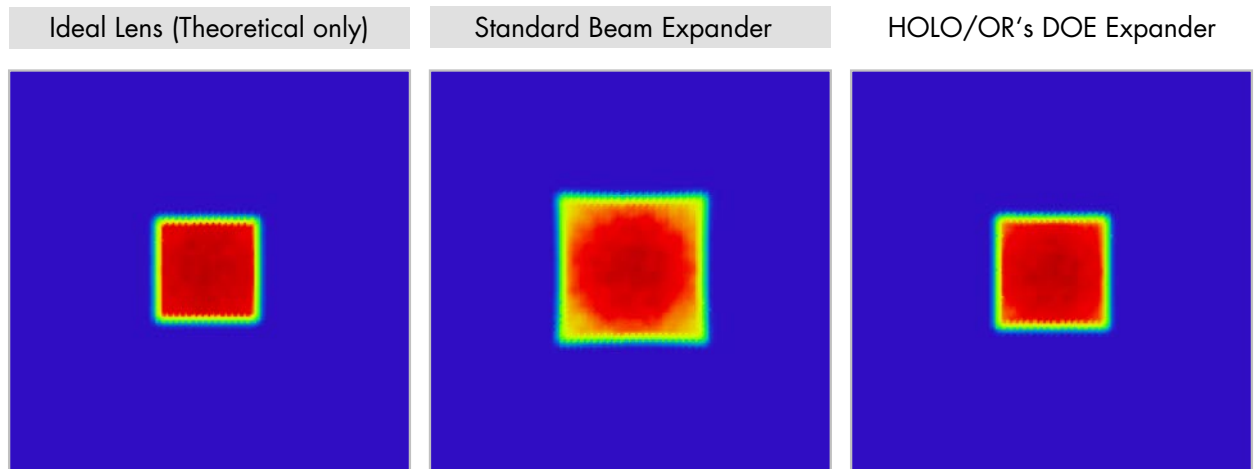
Results



Far-field simulation results for a Square Top-Hat, from left to right, without DOE expander 1.5×1.5 [deg], with DOE expander x5 7.5×7.5 [deg] and with DOE expander x10 $\sim 14 \times 14$ [deg].

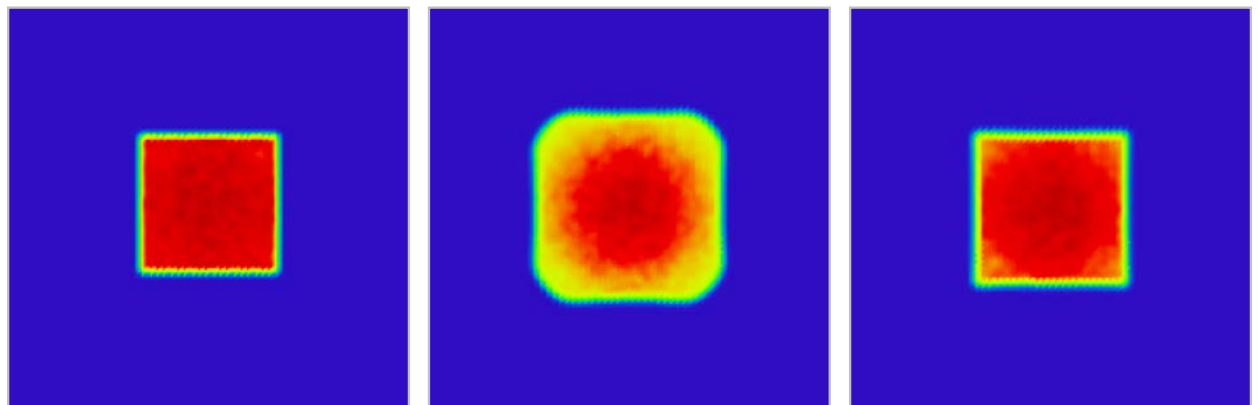
Comparison between Square Top-Hats result at image plane obtained by different expander module elements

Simulation results (from left to right): perfect beam expander (not real lens) for ideal output spot, standard beam expander not optimized for use with a DOE and DOE BEAM Expander optimized for use with a DOE and additional focusing lens after the module.



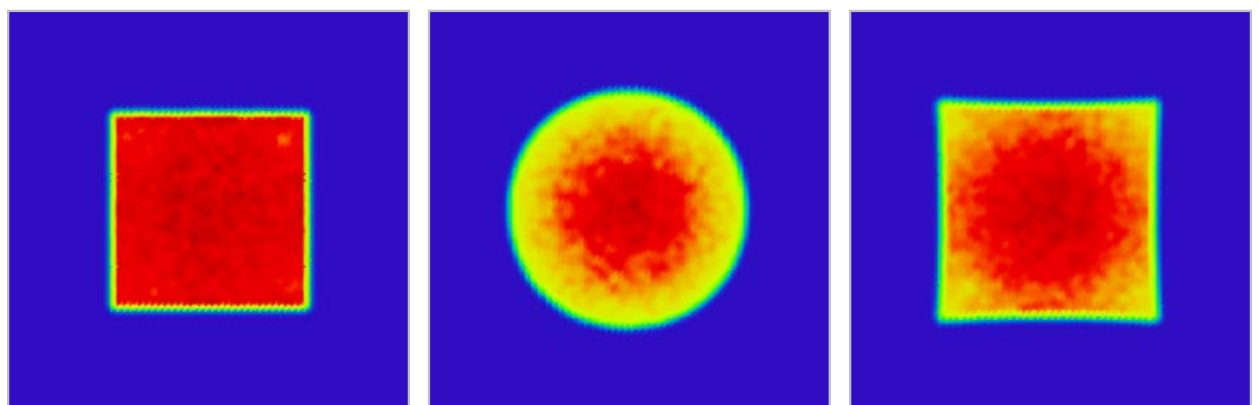
Square Top-Hat 1.6deg

Simulation input parameters: Wavelength 532nm and input beam diameter 8mm.



Square Top-Hat 2.0deg

Simulation input parameters: Wavelength 532nm and input beam diameter 6mm.



Square Top-Hat 2.8deg

Simulation input parameters: Wavelength 532nm and input beam diameter 6mm.