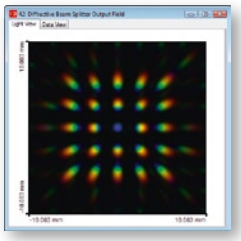
VirtualLab™4

Diffractive Optics Toolbox

Design of diffractive beam splitters, diffusers and beam shapers

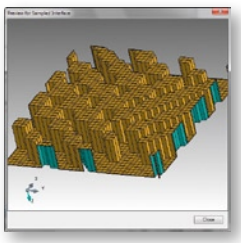


Far field of a diffractive beam splitter illuminated by polychromatic laser light.

The Diffractive Optics Toolbox enables the design of diffractive beam splitters, diffusers and beam shapers. These elements are also known as diffractive optical elements, computer generated holograms, phase plates or kinoforms. Diffractive beam splitters allow the splitting of a laser beam into beam arrays. Diffractive diffusers enable deterministic scattering of light into an arbitrary 2D light pattern. Diffusers and beam splitters can be used for the transformation of coherent and partially coherent light sources. Diffractive and refractive beam shapers enable the reshaping of the intensity profiles of coherent laser beams into circular, rectangular Top Hats, lines or customized 2D intensity distributions.

VirtualLab™ uses the powerful Iterative Fourier Transform Algorithm (IFTA) for the optimization of these elements. Session editors assist users during the design process of typical diffuser and beam splitter setups.

Your Benefit



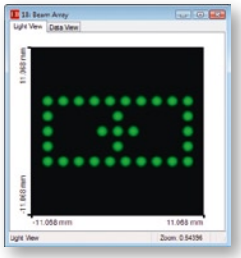
Binary height profile of a period of a diffractive beam splitting element.

- Optimization of diffractive diffusers, diffractive beam splitters, diffractive and refractive beam shapers also known as diffractive optical elements, phase plates, kinoforms, computer generated holograms by the Iterative Fourier Transform Algorithm (IFTA).
- Design of diffractive diffusers for homogenization of LEDs and Excimer laser beams.
- Development of micro structured optical elements for the generation of arbitrary 2D intensity patterns and beam arrays.
- Session editors for assisted design of diffractive diffusers and diffractive beam splitters.

LightTrans

Diffractive Optics Toolbox

Selected Features



Customized beam array generated by a diffractive beam splitting element.

Design of diffractive beam splitters

Beam splitters are typically periodic structures that split one laser beam into a beam array. Users can define uniform or customized weights in order to control the amount of power diffracted in the single beams. Session editors assist you during the design process.

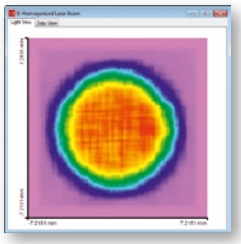
Diffuse light pattern generated by a diffractive diffuser.

Design of diffractive diffusers

Diffusers are periodic or non-periodic structures enabling a deterministic scattering of light in circular, rectangular Top Hats, lines or customized 2D light distributions. Because of the scattering diffusers are insensitive for alignment errors or variations of the intensity of the illuminating laser beam. Session editors assist you during the design process.

Design of diffractive and refractive beam shapers

Diffractive and refractive beam shapers enable the reshaping of the intensity profile of coherent laser beams into circular, rectangular Top Hats, lines or customized 2D intensity distributions. In difference to diffuser systems generated intensity distributions will be free of speckles and will have high homogeneity and high efficiency.



Homogenized and circularized Excimer laser beam.

Homogenization of LED light and Excimer laser beams

The deterministic scattering of diffractive diffusers can be used for the homogenization of LED light and Excimer laser beams. Systems using diffractive diffusers are often more compact and allow a generation of arbitrary 2D intensity patterns in comparison to homogenization systems based on lens arrays. While the Diffractive Optics Toolbox allows the design of diffractive diffusers for a coherent source, the Starter Toolbox enables the analysis of optimized diffuser systems taking into account the spatial and temporal coherence of your light source.

Generation of fabrication data and tolerance simulation

The Diffractive Optics Toolbox allows exporting the surface profiles of micro structured elements in ASCII, bitmap and GDSII-format including the calculation of etching masks. The parameter run and the optimization documents of VirtualLab™ enable the investigation of etching depth, alignment and wavelength tolerances.

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More information concerning this toolbox including a list of all available features is shown on our website **www. lighttrans.com**

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