

Feature.0020

Flexible Region Configuration

A short guide on the generation of regions by using different manners, and their use in different applications, e.g., the diffractive optics merit functions detector.

About This Use Case

- The following toolbox is required
 - Starter toolbox
- This use case is produced with VirtualLab Fusion (Build 7.0.0.35).
- Get your free Trial Version here!

This Use Case Shows ...

 how to generate regions in different manners, and how to use them as signal regions in specific applications.

ate New 2	2D Region				X 5: 2D Region 'Po
Region Ty	pe Simple Polygor	n Region \vee	Spectral Domain	Region Name Polygon Region	
Name A B C D	x-Coordinate -2.5 mm 2.5 mm 1.5 mm -1.5 mm	y-Coordinate -1.4434 mm -1.4434 mm 2.8868 mm 3.5 mm	E Append New E Insert New K Remove Move Up Move Down Validity: ♥	M D C C C C C C C C C C C C C C C C C C C	- S
				OK Cancel Help	



Used as Optimization Region

• Iterative Fourier transform algorithm (IFTA) optimization

🖢 9: Iterative Fourier Transform Algorithm Optimization		
Specification Design Analysis		
Input Field	Propagation	
Wavelength 532 nm	Type of Propagation 1f-/2	
 Constant Input Field 	Focal Length	
O Arbitrary Input Field Set Show	Embed Frame Width	
Terrentering	Pixelation Factor	One can select any active
Sampling Points 472 x 472	Simulate Pixelation Exactly	region documents as
	Output Plane Sampling	Optimization Region for the
Sampling Distance 1.33 µm x 1.33 µm	Sampling Points	design
Type of Transmission Quantized Phase-Only ~	Sampling Distance	Select Ontimization Region
Number of	Field Size	
Quantization Levels	Use Angular Coordinates	1: 2D Region 'Elliptic Region' 3: 2D Region 'Sampled Region'
Output Field Requirements		4: 2D Region 'Rot. Rect. Region'
Desired Output Field Set Show	Limit Stray Light	
Optimization Region Set Show	Maximum Relative Intensity of Stray Light	
Create Optimization Region from Desired Output Field	Limit Feature Size	
Allow Phase Freedom	Minimum Feature Size	
Allow Scale Freedom	Maximum Stray Light Intensit	
Limit Scale Factor According	for Higher Frequencies	Ok Cancel

Used as Evaluation Region

the second second second

• Diffractive optics merit functions detector

22	Detector Window and Resolution Detector Function
	Vectorial Component Ex Component
Geometry / Channels Position / Orientation	Selected Merit Functions
	 ✓ Window Efficiency ✓ Conversion Efficiency ✓ Signal-to-Noise Ratio ✓ Uniformity Error ✓ Relative Zeroth Order Intensity Zeroth Order Efficiency Maximum Relative Intensity of Stray Light Optimal Scale Factor
	Output Field Requirements
	Desired Output Field Set
	Evaluation Region Mode Arbitrary Evaluation Region
	Evaluation Region Set
	Allow Scale Freedom 🎽 Load
	Signal Type Select from Documents
	Efficiency Related to Incident Field of Optical System
	Accurre Connectria Field Zana faz Datastas Fusikution 🛛 💷

One can select any active region documents as *Evaluation Region* for the detector.



Used as Grating Region

• Grating region configuration in waveguide toolbox

Edit Grating Region	×	
Shape Region Channels Grating		
Spectral Domain Load Definition Center X 0 m Center X 0 m Width 1 mm Keep Aspect Ratio	Region Name Square Region Region Type Rectangular Region	One can select any active region documents as <i>Evaluation Region</i> for the
Validity: 🕑 Rotation Angle 0°	[×] [№] -0.4 -0.2 0 0.2 0.4 X [mm]	Select a 2D Region × 5: 2D Region 'Composed Region' × 4: 2D Region 'Sampled Region' 3: 2D Region 'Rectangular Region'
Validity: 🕑	OK Cancel Help	

Ok

Cancel

Region Generation



- In the *Functions* ribbon, we click on the *Region* icon.
- In what follows, we take 2D regions as examples.

Create New 2D	Region			
Region Type	Rectangular Region	~	Spectral Domain	Region Name Rec
Definition of Center X Width	Unrotated Rectangle 0 m 10 mm Kee	Center Y [Height [p Aspect Ratio	0 m 5 mm	 [mm]
	Rotation Angle	C	Validity: 🕑	-4 -2
				OK Car

Region Generation



- Rectangular region
 - Define center position, width and height, and rotation angle.

Create New 2D Region Region Name Ro Region Type Rectangular Region Spectral Domain \sim Definition of Unrotated Rectangle Center X 0 m Center Y 0 m 10 mm 5 mm Width Height 2 ۲ [mm] Keep Aspect Ratio 0 Validity: 🕥 Q. 30° Rotation Angle 1: 2D Region 'Rot. Rect. Region' - O X 2D Region 4 N [mm] -2 0 2 4 X [mm]

Rectangular region is defined analytically by its parameters, and thus can be zoomed arbitrarily.

- Polygon region
 - Type in positions of polygon vertices in successive sequence.

eate New 2	2D Region			×
Region Ty	rpe Simple Polygor	n Region 🗸	Spectral Domain	Region Name Polygon Region
Name A B C D	x-Coordinate -2.5 mm 2.5 mm 1.5 mm -1.5 mm	y-Coordinate -1.4434 mm -1.4434 mm 2.8868 mm 3.5 mm	E Append New	
				OK Cancel Help



Polygon region is also defined analytically by its parameters.

- Elliptic region
 - Define center position, half axes, and rotation angle.



Elliptic region is defined analytically by its parameters.

- Sampled region
 - It is defined by sampled data, which can be loaded from existing file, imported from text or bitmap, or selected from active Numerical DataArray in VirtualLab window.
 - We load the attached Numerical DataArray.

Pixelated effect from discrete sampling points is obvious.



- Composed region
 - Create two subregions, both in circular shape.
 - One with smaller radius and the other larger.
 - Choose XOR under Composition Mode.
 - A ring shape is then obtianed.



Document & Technical Info

code	Feature.0020
version of document	1.0
title	Flexible Region Configuration
category	Configuration
author	Site Zhang (LightTrans)
used VL version	7.0.035
last modified on	August 28, 2017