

Plug-In Mode Generator

Abstract



In this tutorial we demonstrate how to program your own customizable source mode in VirtualLab Fusion.

Where to Find the Component



The *Plug-in Mode Generator* can be found under Light Sources/Basic Source Models/Plug-In Mode Generator in *the Optical Setup* document.

Domain and Aperture

Edit Plug-In Mode G	enerator	×
Coordinate Systems	General Coordinate System Spatial Distribution Spectrum Medium at Source Plane Air in Homogeneous Medium	
Position / Orientation	Generate Mode in Ox-Domain K-Domain	
	Shape Rectangular Elliptic Size 1.28 mm × 1.28 mm	
Parameters	Relative Edge Width 10 % Absolute Edge Width 128 μm	
	OK Cancel Help	

The Plug-in Mode Generator can be defined in xand k-domain. The corresponding aperture will automatically adjust to the correct coordinate units.

Coordinate System

General Coordinate System Spatial Distribut Coordinate Define Coordinate System via Algoriti Coordinate Position Values X Y Z Orientation Angles Orientation Definition Type Sequence of Source Mode Direction Definition Parameters Fix Angle / Axis 1	tion Spectrum hm User Interface 0 mm 0 mm 0 mm 0 mm (##) Value \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	The coordinate system of the mode can be free defined. Either you rotate and shift the source similar to a component or you can specify the coordinate system inside the programmable code. This also allows for the creation of tilted sources.
	Note: Only the coor	rdinate system of the
	source mode is sh	hifted. The black bar 🖌 💡

Programming the Source



The Spatial Distribution tab (Spectral Distibution tab in case of a k-domain mode) allows access to the programmable snippet that defines the source.

For an in-depth tutorial on how to operate with VirtualLab Fusion snippets please follow this link:

On the following pages we would like to discuss to examples.

Example: Plane Wave with Hole

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As an easy introduction to the technology, we want to program a rectangular plane wave with a circular hole in the middle of it.

Plane Wave with Hole - General Aperture Configuration

Plug-In Mode G	enerator (PlugIn Mode Generator)	
Coordinate	General Coordinate System Spatial Distribution Spectrum Wavelength Selection Medium at Source Plane Air in Homogeneous Medium Image: Coordinate System Image: Coordinate System	
Systems	Generate Mode in Ox-Domain k-Domain	
Position / Orientation	Apply Aperture to Source Mode Shape Destangular Destangular Destangular	
	Size 1.28 mm × 1.28 mm	
Parameters	Relative Edge Width 5 % Absolute Edge Width 64 µm	
🔇 Assistant	OK Cancel He	lp

We define the source in x-domain. The outer shape is determined by the aperture which we set to rectangular.

#region Main method

HarmonicFieldMode hfm_test = HarmonicFieldMode.GenerateDefaultHarmonicFieldMode(embeddingMedium, wavelength, fieldSize, !generateModeInXDomain, 1001, 1001);

Create default harmonic field mode.

#region Main method
HarmonicFieldMode hfm_test = HarmonicFieldMode.GenerateDefaultHarmonicFieldMode(embeddingMedium, wavelength, fieldSize, !generateModeInXDomain, 1001, 1001);
//get Ex/Ey
ComplexField cfEx = hfm_test.GetEquidistantExData();
Extract data for Ex. We are only interested in this component.







hfm_test.SetEquidistantExData(cfEx); Store data for Ex.



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Required packages	-
Software version	2025.1 (Build 1.172)*
Category	Use Case
Further reading	 <u>Plug-in Detector</u> <u>Plug-in Component</u> <u>Including Pulses into VirtualLab Fusion</u>

* The files attached to this document require the specific version or later.