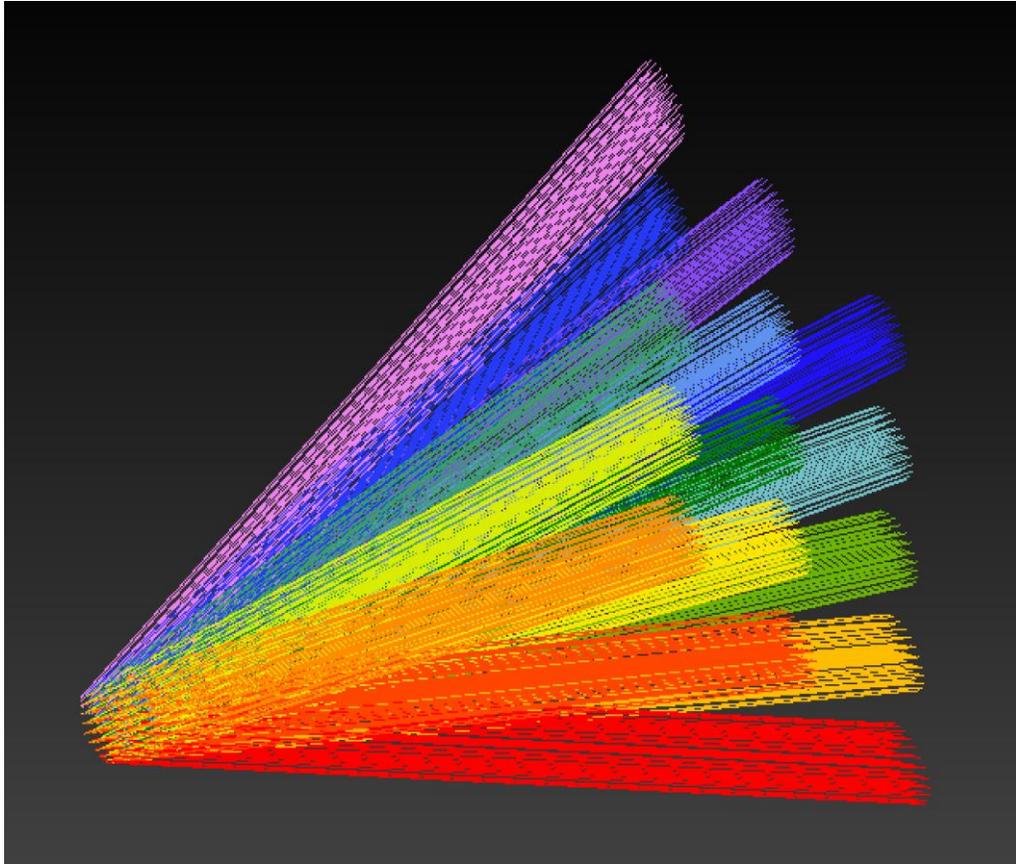# How to Set Up a Scanning Source

Abstract

With the scanning source in VirtualLab Fusion, it is possible to define a multi-mode source that radiates into different pre-defined directions. The scanning source can be used, e.g., in a laser scanning system for analyzing the performance under different scanning angle, or in an imaging system for the modeling of certain field of view. Together with Parameter Run, the directions/angles can be scanned in different modes, and one can define it flexibly for specific applications.

Basic Parameters

- For each scanning angular direction, there is one mode representing the field.

- All modes share the same aperture shape and size (defined in the plane orthogonal to the mode direction), and these parameters can be configured in the Basic Parameters tab.

- Further, the relative or absolute edge width can be configured.
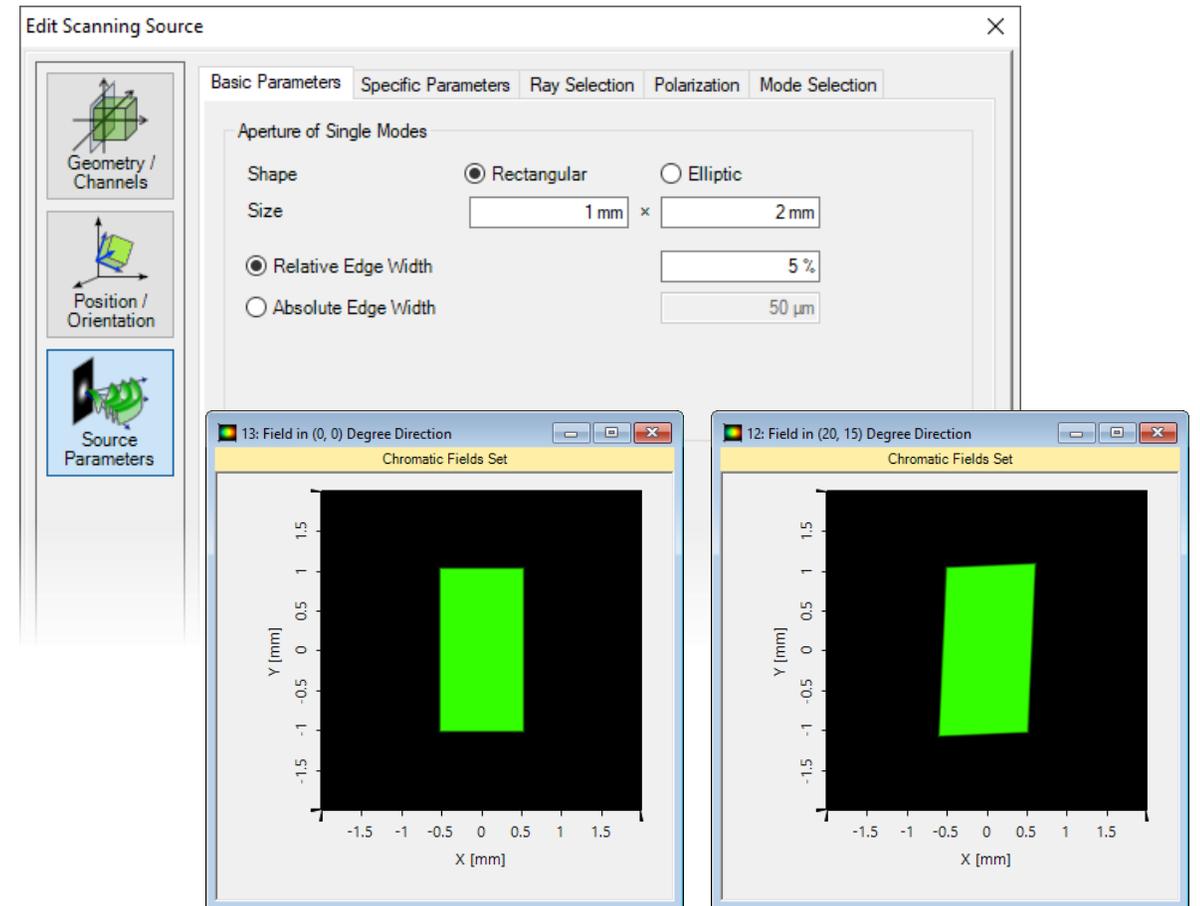
mode in $(0°, 0°)$ direction on the input plane

mode in $(20°, 15°)$ direction on the input plane

Specific Parameters – Intensity

- The Specific Parameters tab controls the intensity and angular settings of the source.

- The distribution of the intensity can be set according:
  - To a desired variation by specifying a Chromatic Fields Set, or by importing an image file. In this case, the wavelengths are chosen from the input.
  - Or constant over all scanning angles for one wavelength. In this case, the number of directions can be set, which means the number of scanning steps along x- and y-direction.
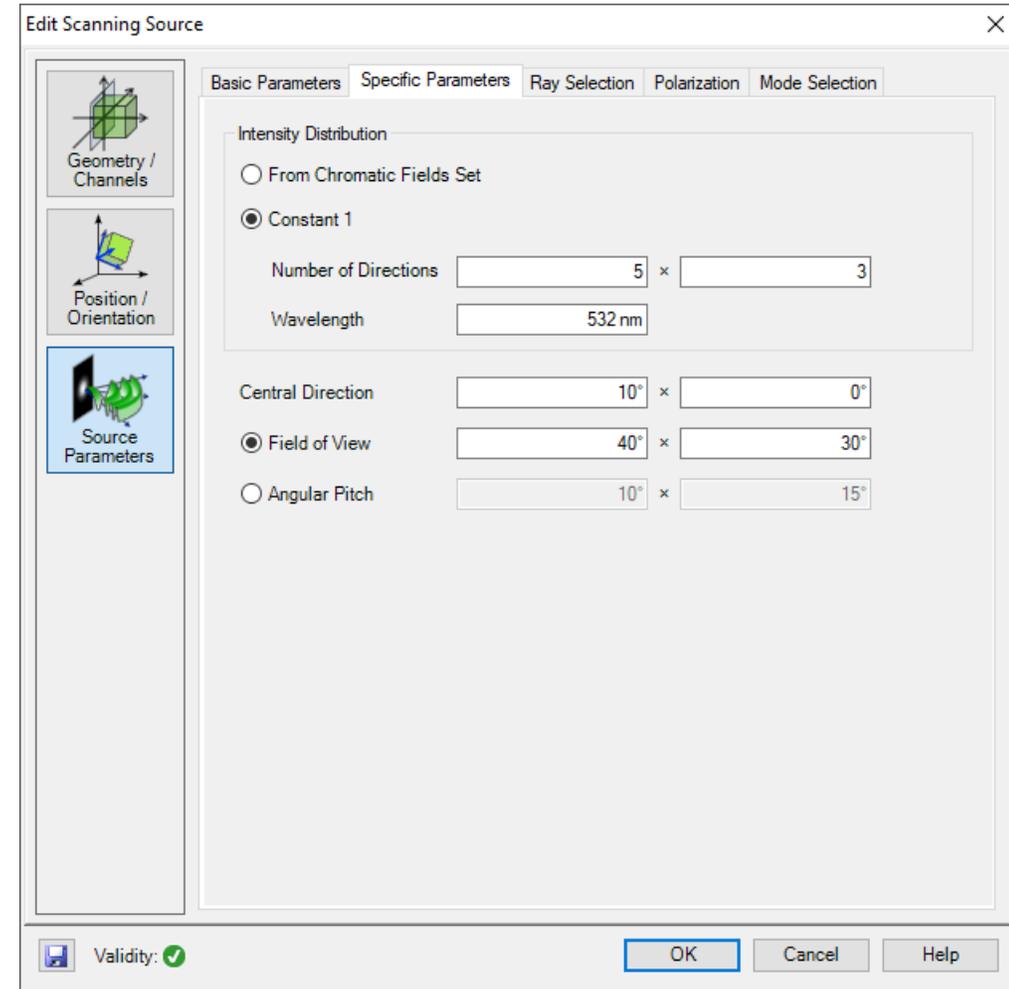
Specific Parameters – Angular Settings

- The Specific Parameters tab controls the intensity and angular settings of the source.

- You can set the Central Direction, i.e. the direction into which the center of the overall field propagates.

- The scanning range can be configured either by a specific Field of View or by the Angular Pitch of each scanning direction.
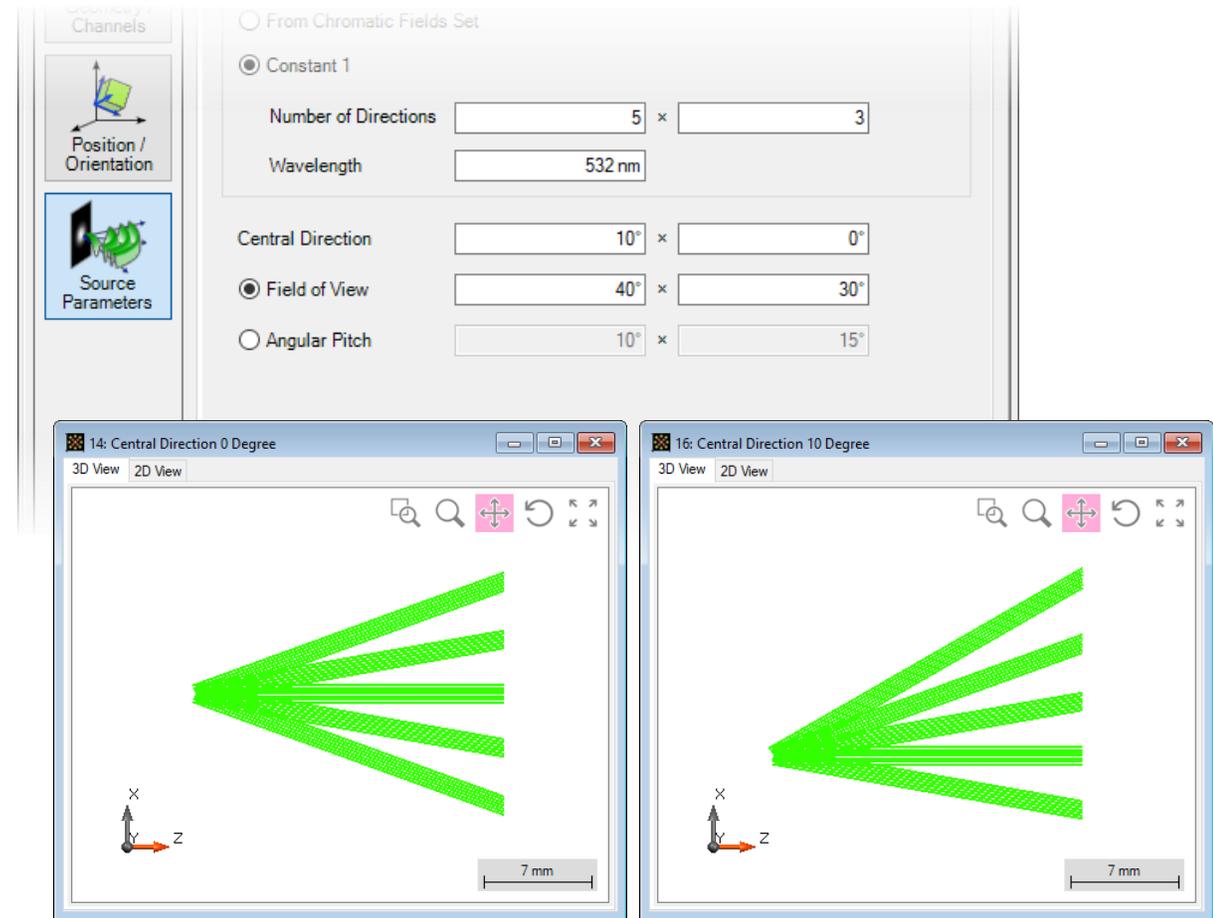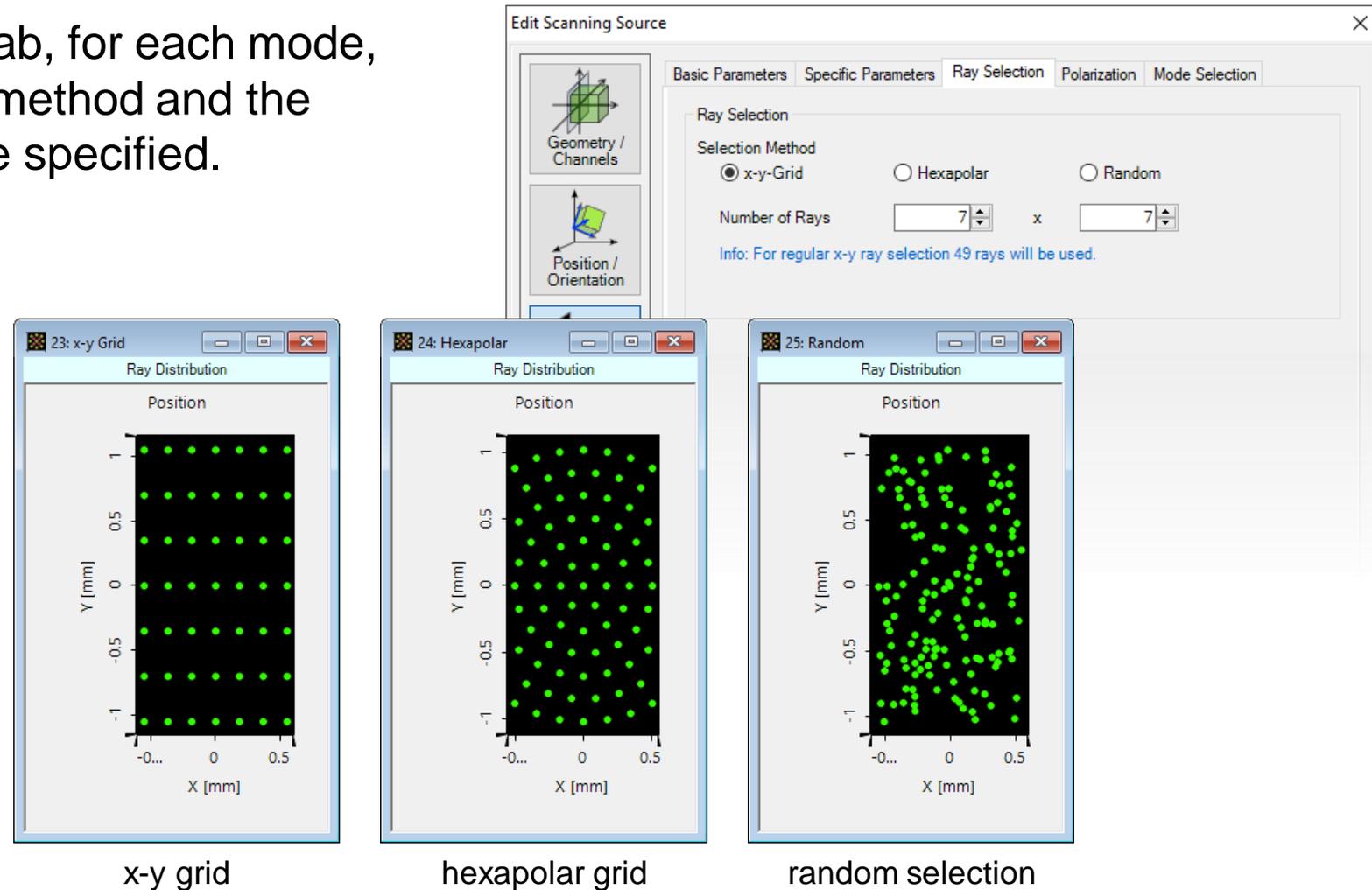

with field of view 40°
and central direction in 0°

with field of view 40°
and central direction in 10°

Ray Selection

- In the Ray Selection tab, for each mode, the desired selection method and the number of rays can be specified.

x-y grid   hexapolar grid   random selection

Polarization Settings

- The Polarization Settings tab provides the polarization options for all scanning directions.

- The polarization state can be:
  - linear,
  - circular,
  - elliptical,
 - general input via Jones matrix.
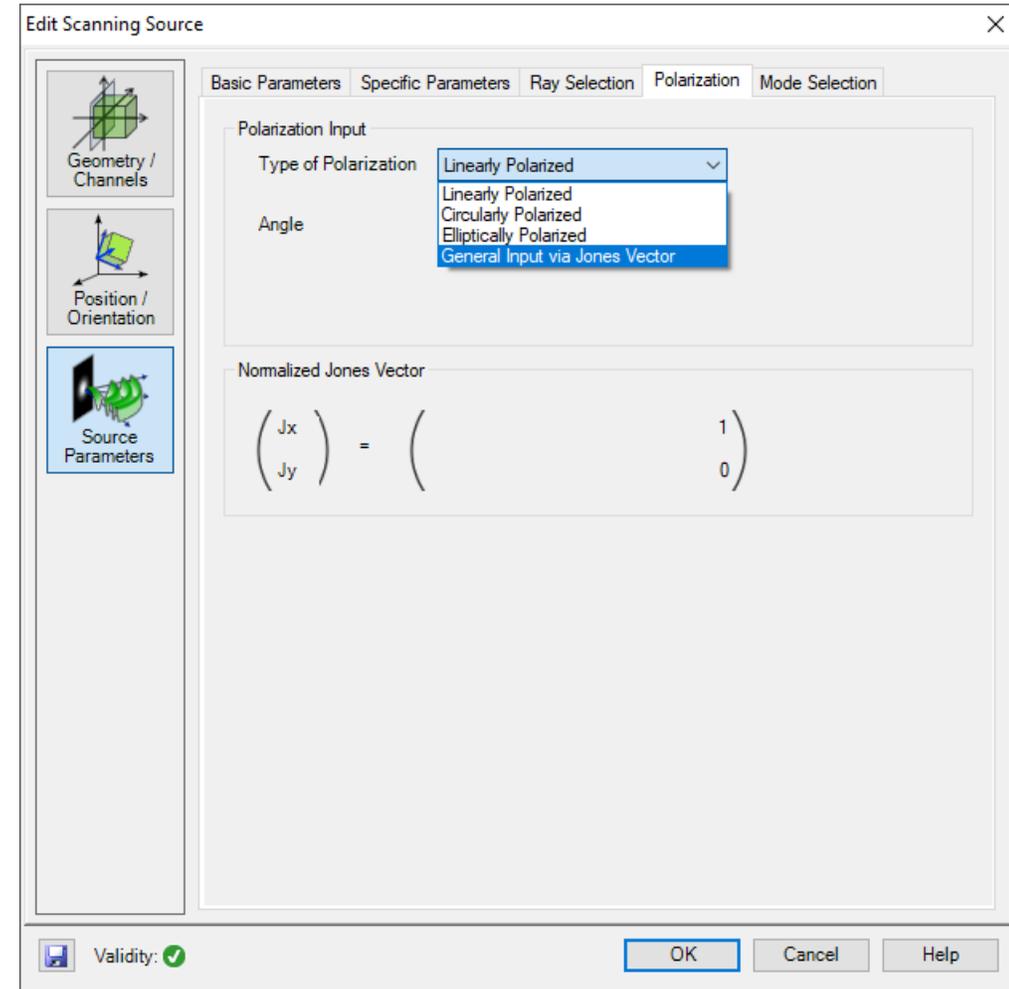
Mode Selection

- In the Mode Selection tab, different possible spectral components and scanning directions can be selected.

- The wavelengths can be selected individually or all together.

- The scanning direction can be chosen within a specified column or row of angles or can be chosen as a single direction.
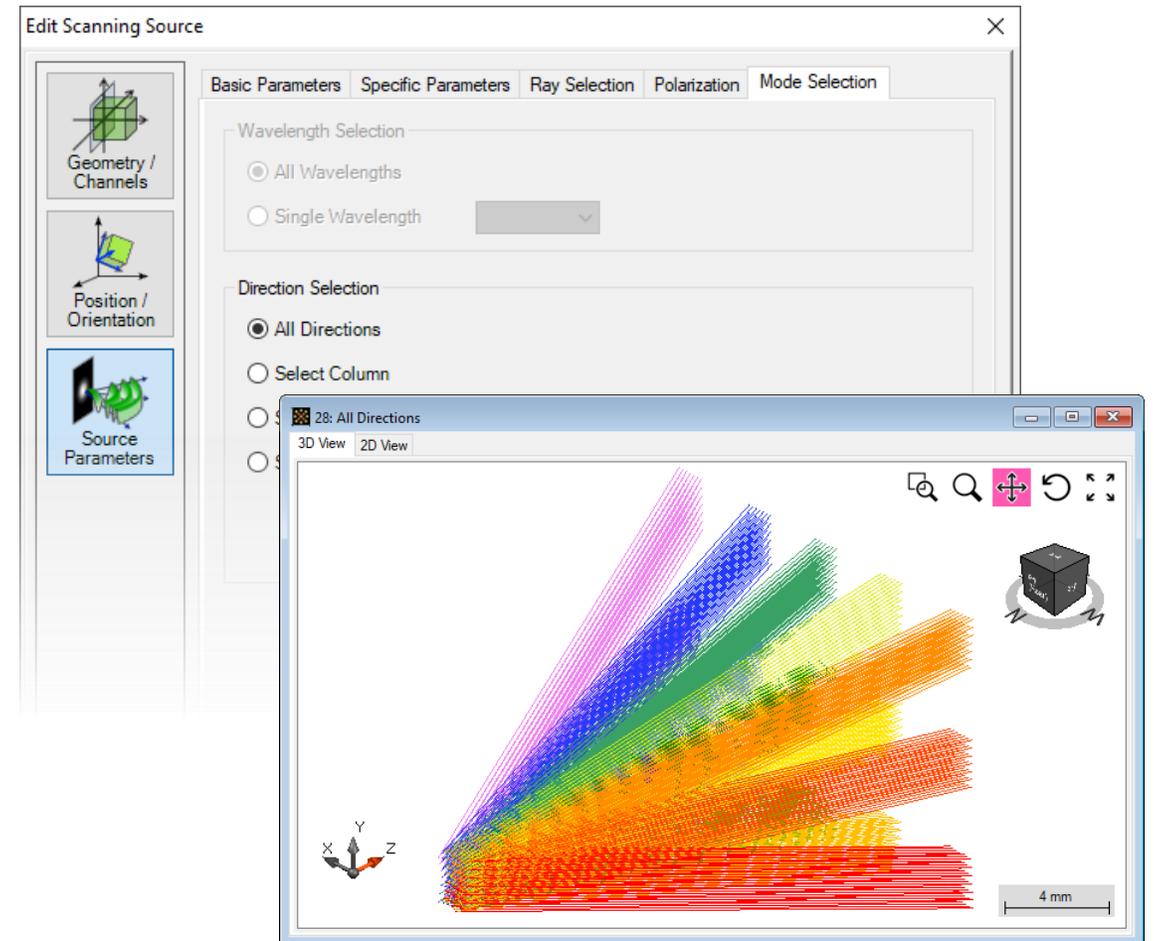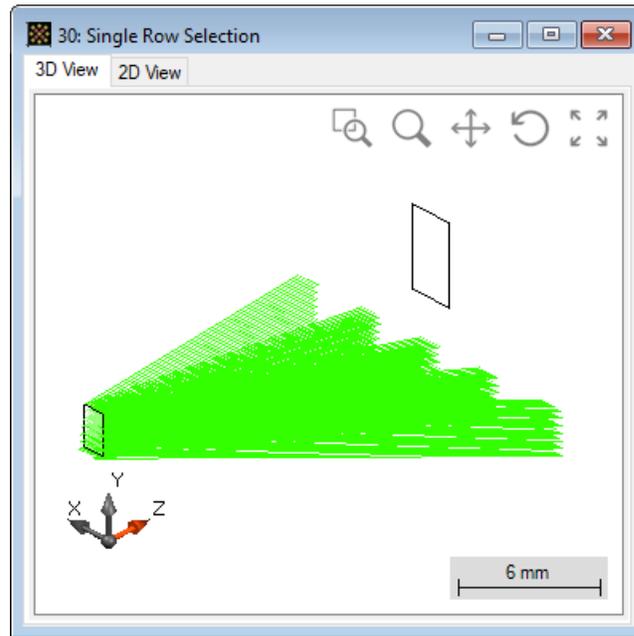

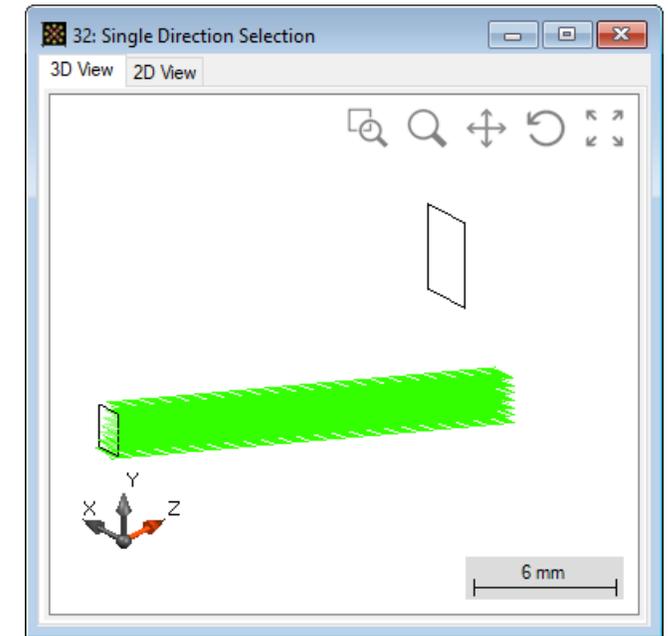with all scanning directions

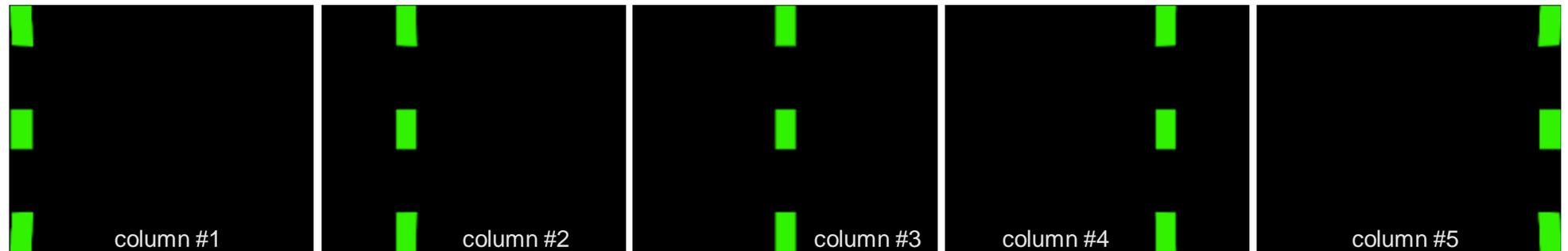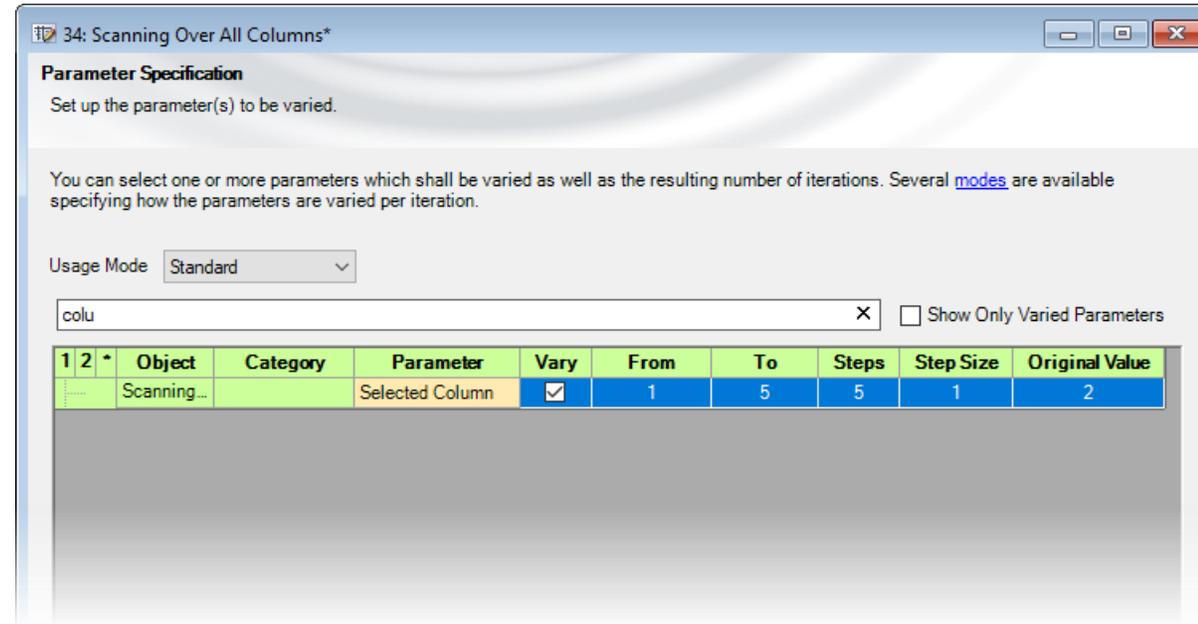# Mode Selection
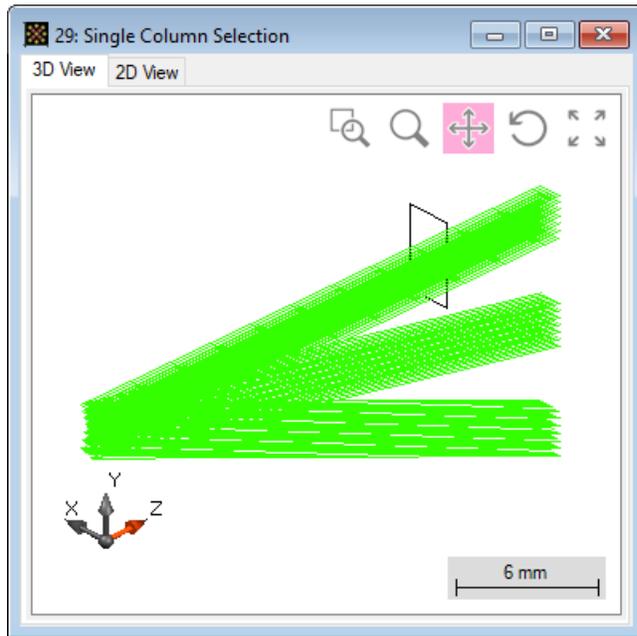
- Single column
- Single row
- Single direciton

# ParameterRun – Scanning over Columns / Rows

- In mode selection tab, check select column.

- Start Parameter Run and scan over selected column index.

- In a similar way, one can also scan over rows.

scanning from column 1 to 5

ParameterRun – Scanning over Each Single Direction

- In mode selection tab, check select direction.

- Start Parameter Run and switch to scanning mode. Then scan over selected column and row indices.
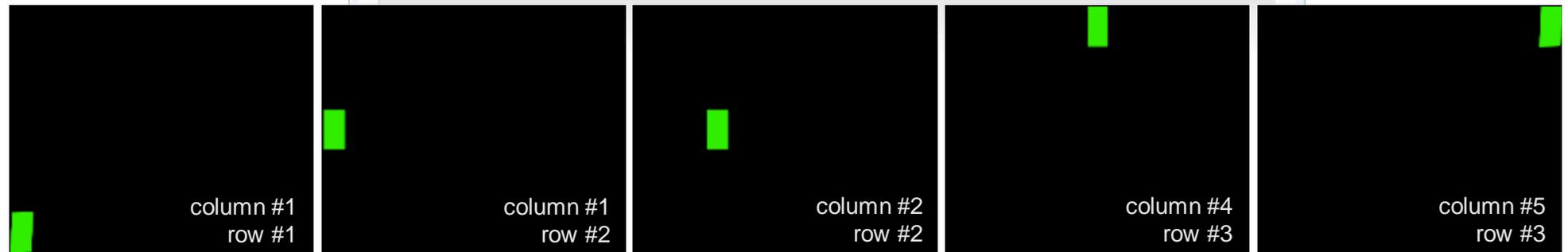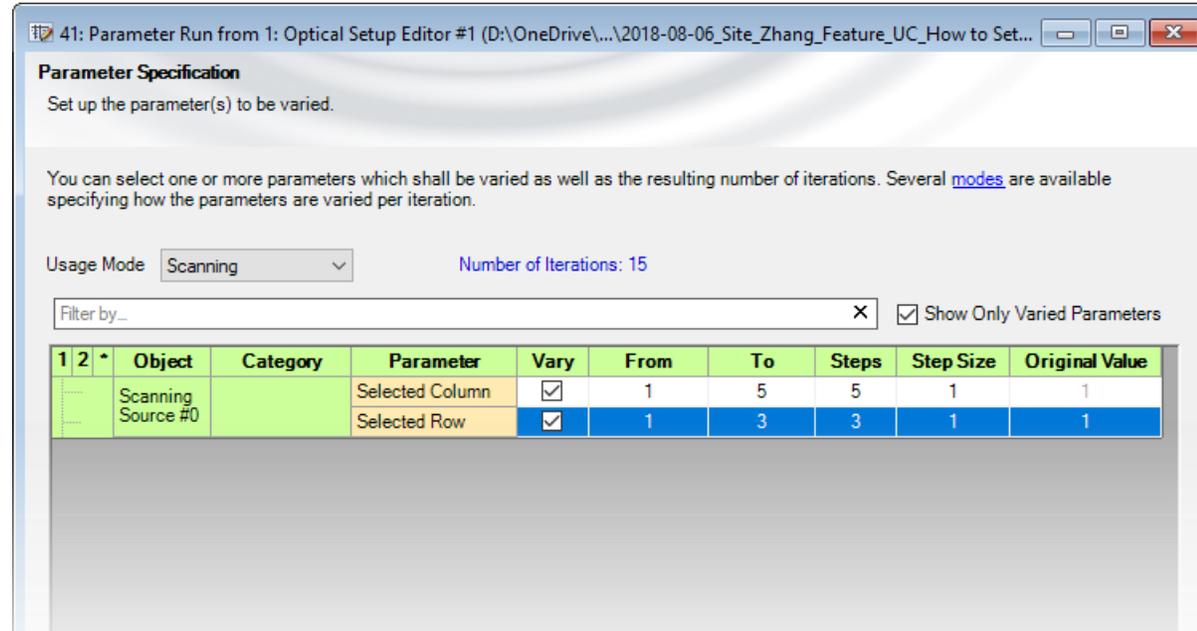
scanning over all directions, with selected indices

Document Information

title	How to Set Up a Scanning Source
document code	MISC.0066
version	1.1
toolbox(es)	Starter Toolbox
VL version used for simulations	VirtualLab Fusion Summer Release 2019 (7.6.1.18)
category	Feature Use Case
further reading	- Performance Evaluation of an F-Theta Scanning Lens - How to Set Up a Panel-Type Source