

Feature.0016

Usage of PSF/ MTF Detector

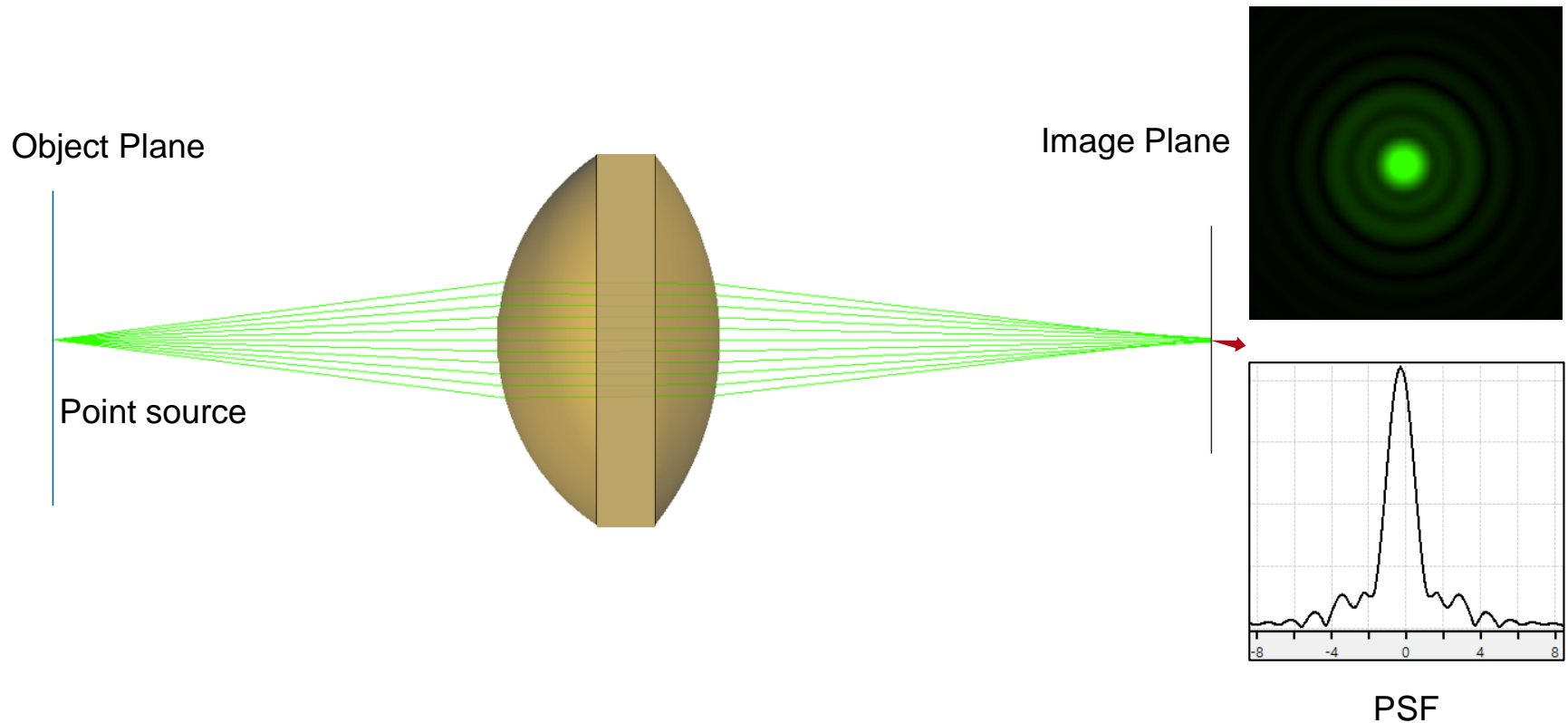
Easily access to the point spread function (PSF) and the modulation transfer function (MTF) of an imaging system.

About This Use Case

- The following toolbox is required:
 - Starter toolbox
- This use case is created by using VirtualLab Fusion (Build 7.0.0.35).
- Get your free Trial Version [here!](#)

This Use Case Shows ...

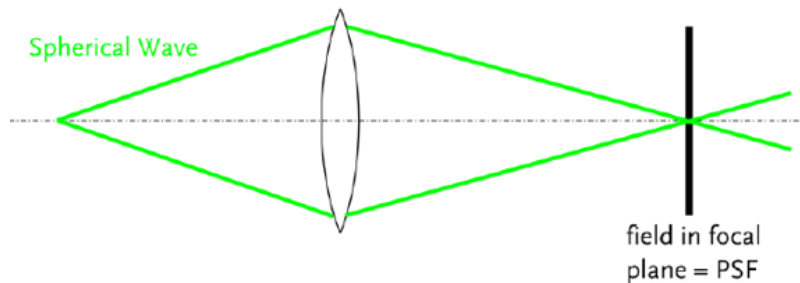
- the definition of PSF/ MTF, setting of the detector and how to use it in VirtualLab Fusion.



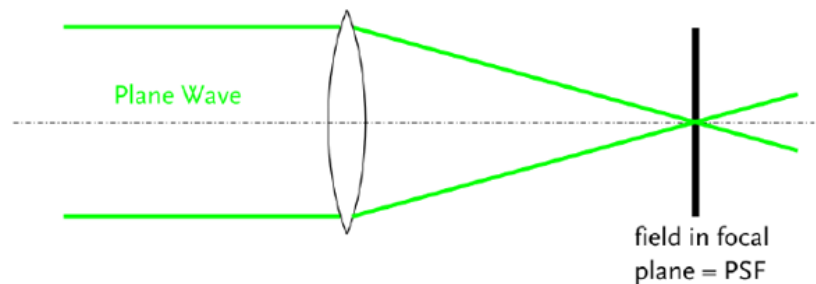
What is PSF and MTF?

- PSF: the **point spread function** describes the response of an imaging system to a point source or point object.

Optical System for Divergent Light



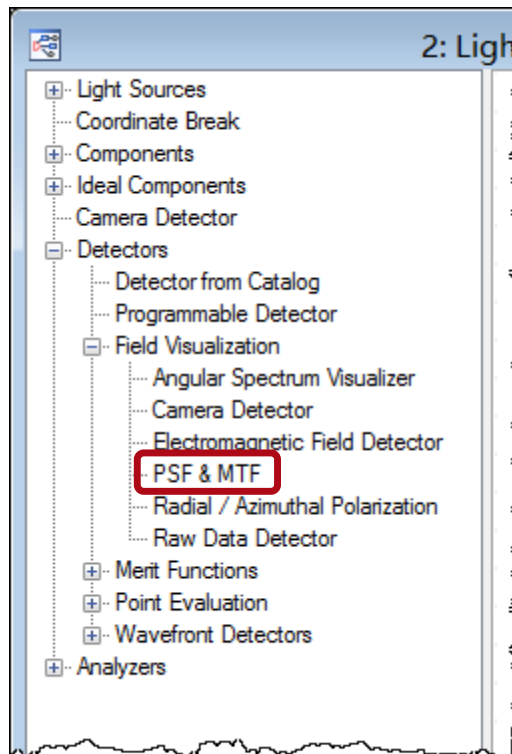
Optical System for Collimated Light



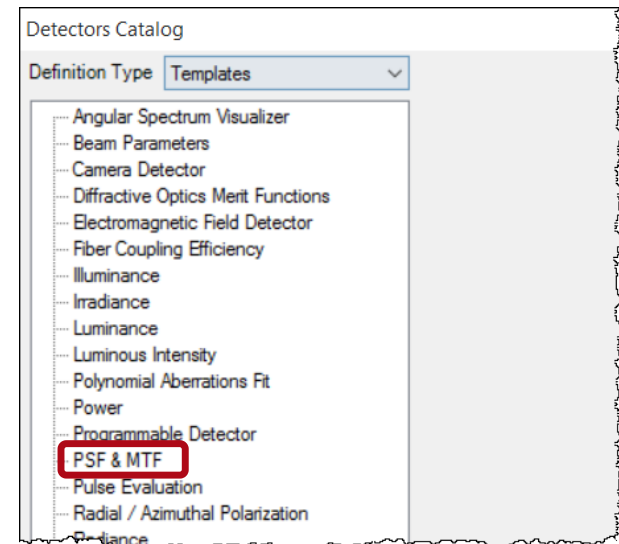
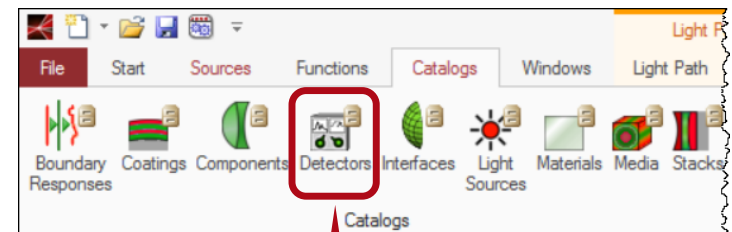
- MTF: the **modulation transfer function**, is defined as the Fourier transform of the point spread function.

Where to find PSF/MTF Detector in VLF

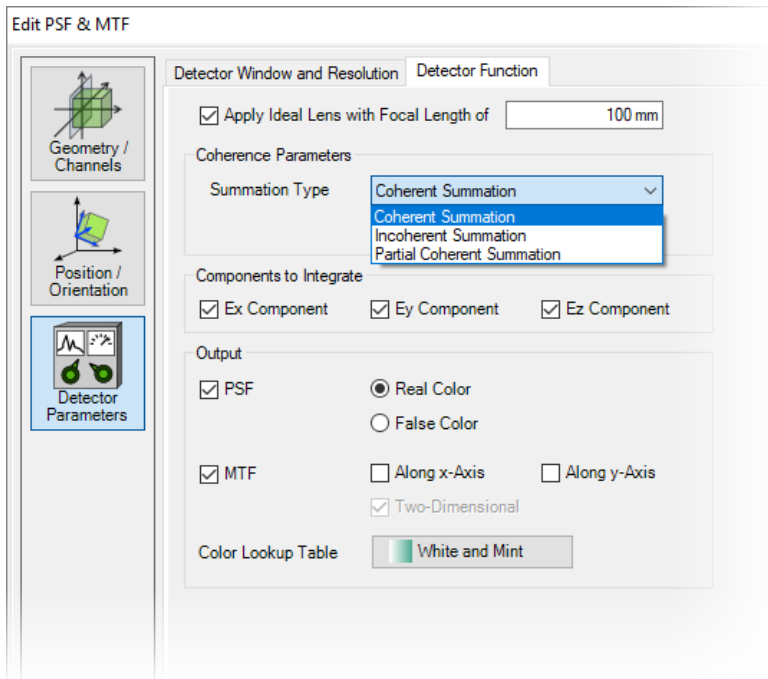
Light Path Diagram



Catalogs → Detectors



Setting of PSF/ MTF Detector



Description

Apply Ideal Lens is an option to calculate the PSF at the focal plane of an ideal lens (at current position), with a customized focal length.

Coherence Parameters determines how the modes shall be handled.

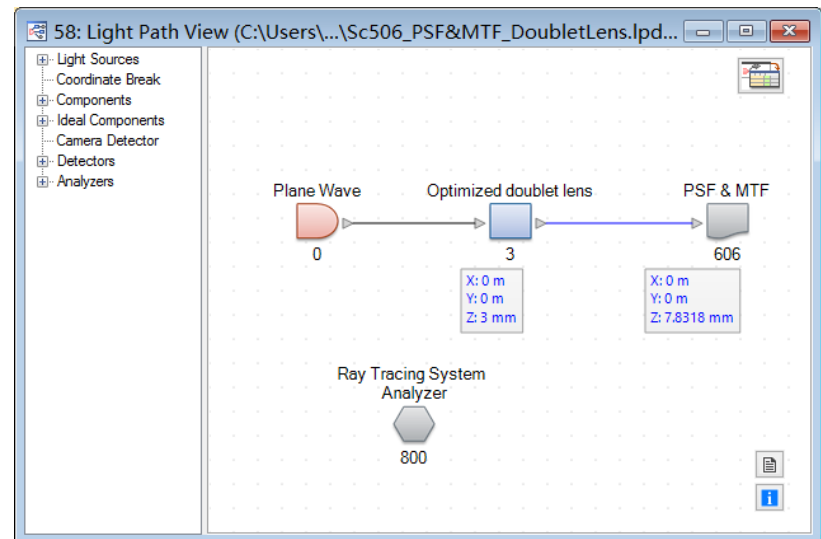
Components to Integrate controls the vectorial components to be used for calculation.

Output can be selected from

- PSF displayed in either real color or false color,
- MTF displayed either along x/y-axis, or in two dimension, and in false color according to selected color lookup table.

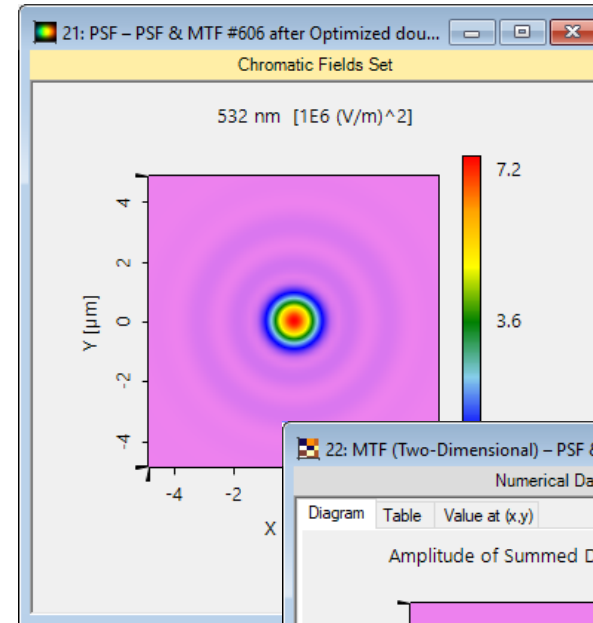
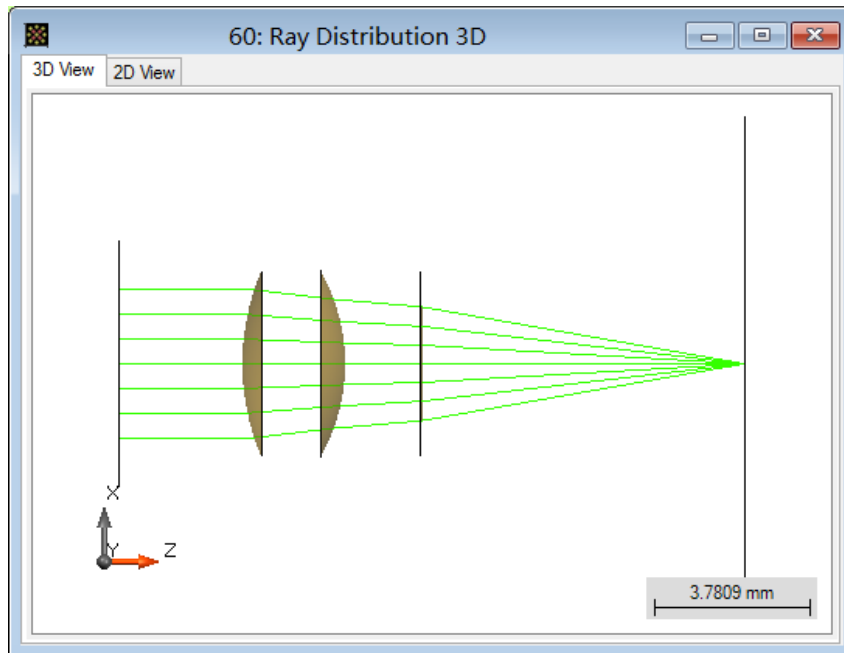
Example

- We will measure the PSF and MTF at the focal plane behind a doublet, and set the detector as follows
 - without ideal lens
 - coherent summation
 - E_x , E_y and E_z to integrate
 - both PSF and MTF (2D) in false color.



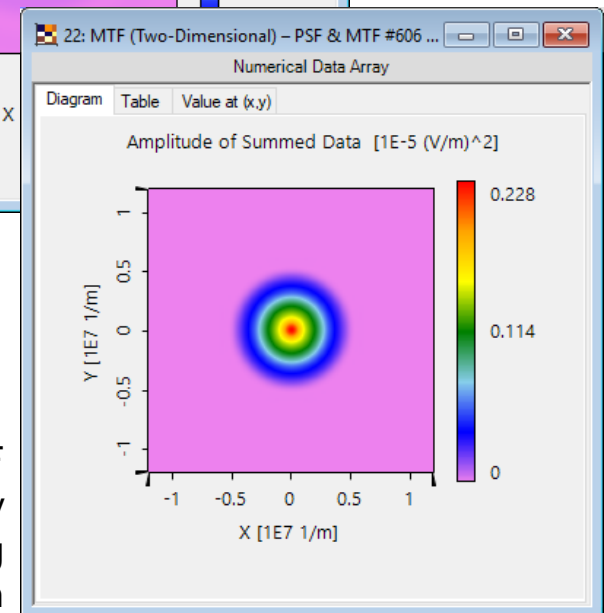
Simulation Results

Ray Tracing System Analyser



PSF
obtained by
field tracing
simulation

MTF
obtained by
field tracing
simulation



Document & Technical Info

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