Advanced PSF & MTF Calculation for System with Rectangular Aperture
Abstract

The performance of an imaging system can be strongly influenced by aperture. Apertures in different shape and size may alter the point spread function (PSF) and the modulation transfer function (MTF). To investigate such effects, a rotated rectangular aperture is placed behind input plane waves with different sizes. The plane waves are then focused by an ideal lens, and on the focal plane the PSF and MTF are analyzed in different situations.
Modeling Task

input plane wave
- wavelength 532nm
- circular shape
- diameter 4mm to 10mm

rotated aperture

ideal lens

PSF

MTF

20mm

6mm

4mm

30°
Results

- **PSF**
- **MTF**

Input field diameter 10 mm

Field behind aperture

$x$ [mm]

$y$ [mm]

$z$
Results

- Input field diameter: 6 mm

- Field behind aperture

- PSF

- MTF
Results

- Input field diameter: 4 mm
- Field behind aperture
- PSF: Plot showing the point spread function
- MTF: Modulation transfer function

Images show the distribution of intensity and the frequency response of the system.
## Document Information

<table>
<thead>
<tr>
<th>title</th>
<th>Advanced PSF &amp; MTF Calculation for System with Rectangular Aperture</th>
</tr>
</thead>
<tbody>
<tr>
<td>version</td>
<td>1.0</td>
</tr>
<tr>
<td>VL version used for simulations</td>
<td>7.0.3.4</td>
</tr>
<tr>
<td>category</td>
<td>Technology Use Case</td>
</tr>
</tbody>
</table>