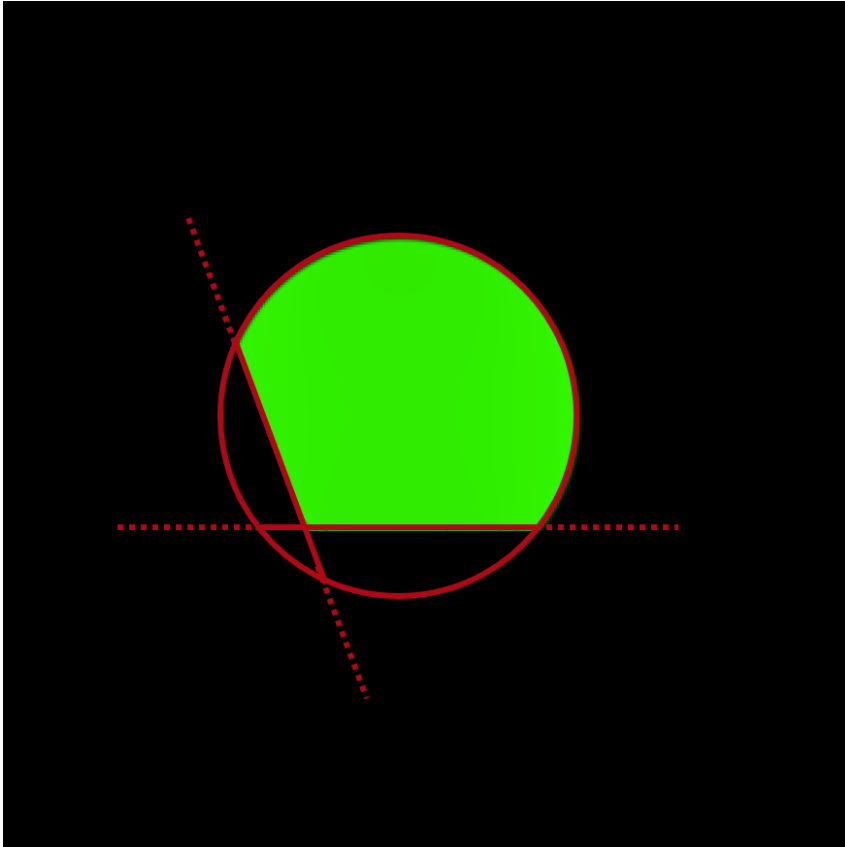


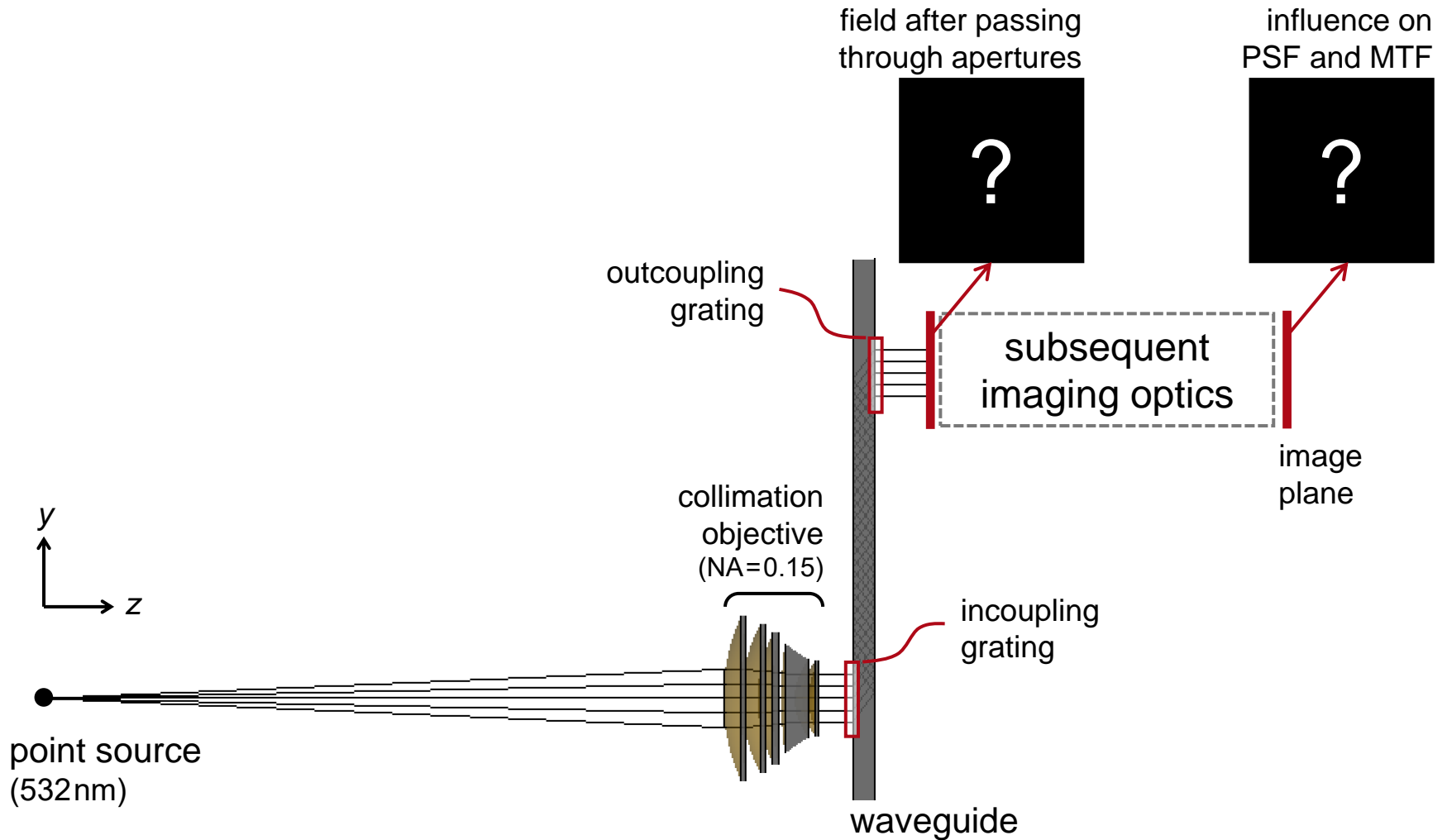
Analysis of Folded Imaging System with Multiple Apertures

Abstract

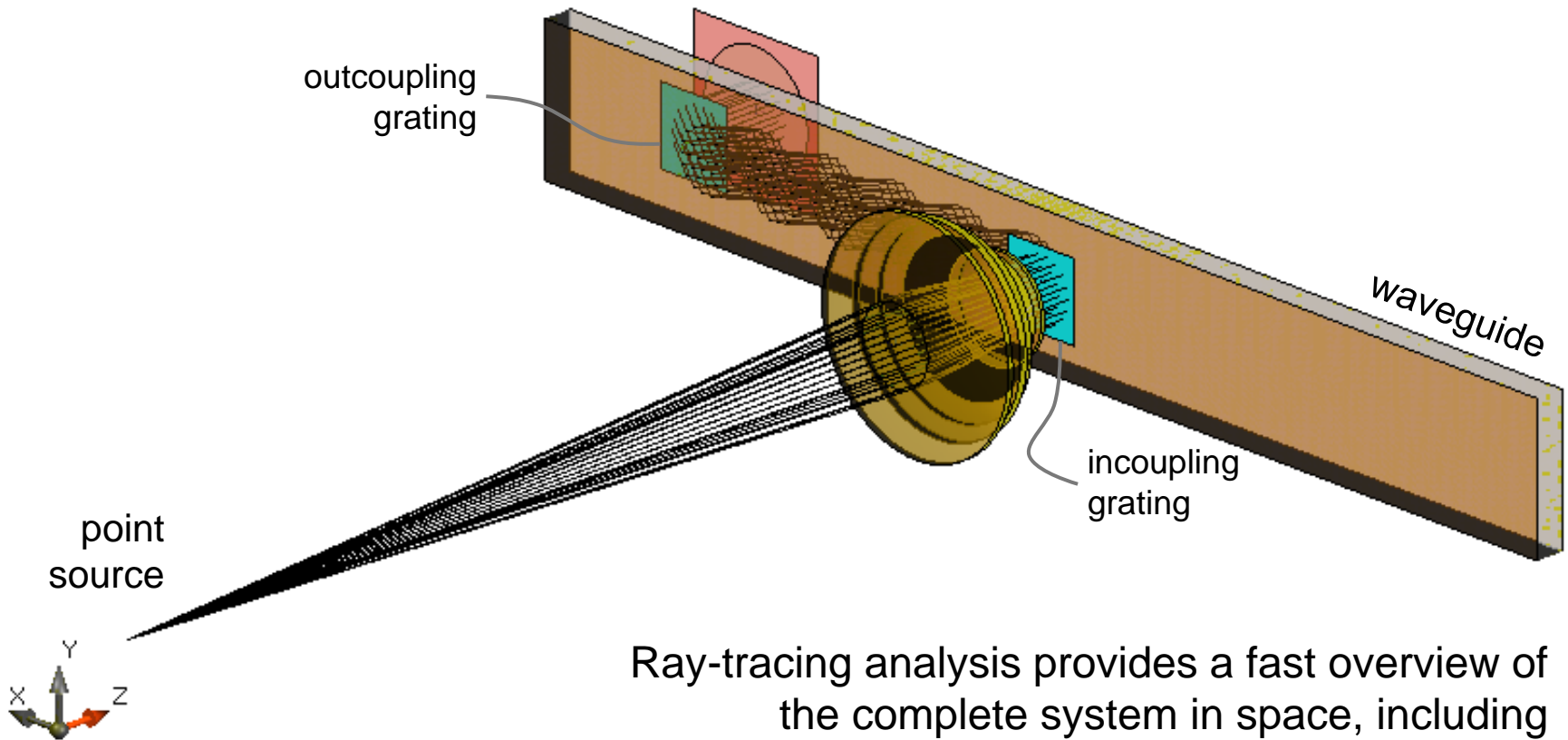


In a near-to-eye display system, the image generation unit, the collimation optics, the waveguide and the in- and outcoupling gratings, form a complex folded imaging system. Each part of the system may truncate the light, and therefore the multiple apertures effect must be taken into consideration for the evaluation of the imaging quality. In this example, it is shown that how differently configured in- and outcoupling gratings affect the field at the exit of the waveguide, and how it influence the PSF and MTF on image plane.

Modeling Task



Results



Ray-tracing analysis provides a fast overview of the complete system in space, including waveguide and coupling gratings.

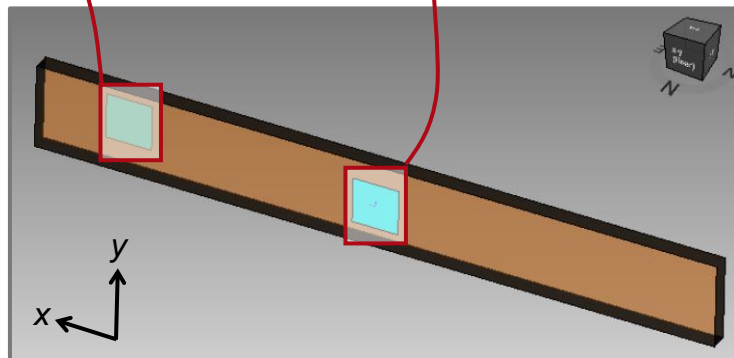
Results

outcoupling grating region

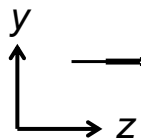
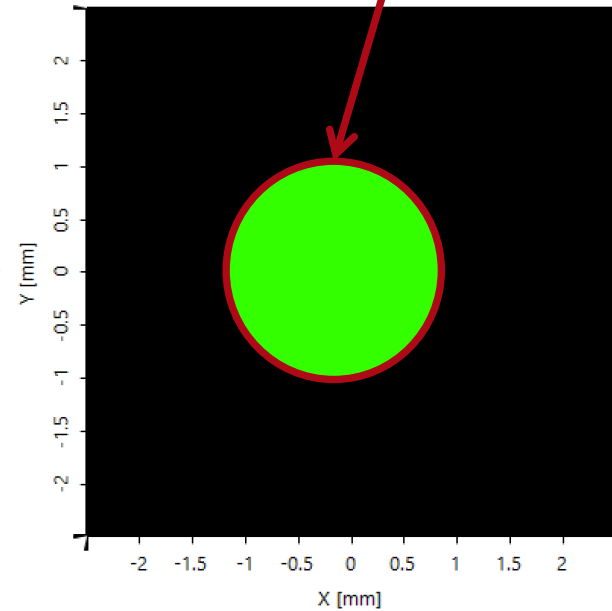
- center at (15, 0mm)
- size 2.7×2.7 mm

incoupling grating region

- center at (0, 0mm)
- size 2.7×2.7 mm



aperture of pupil



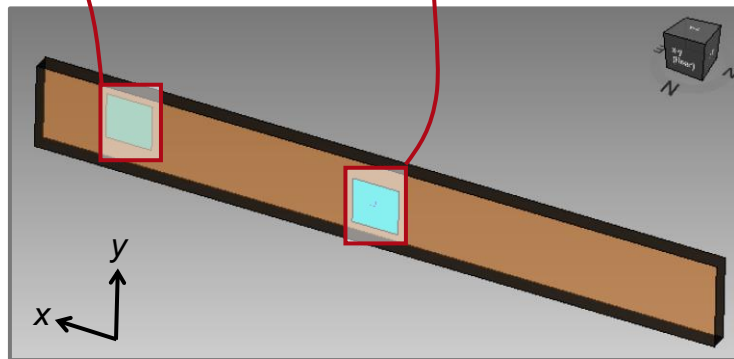
Results

outcoupling grating region

- center at (15, 0mm)
- size 2.7×2.7mm

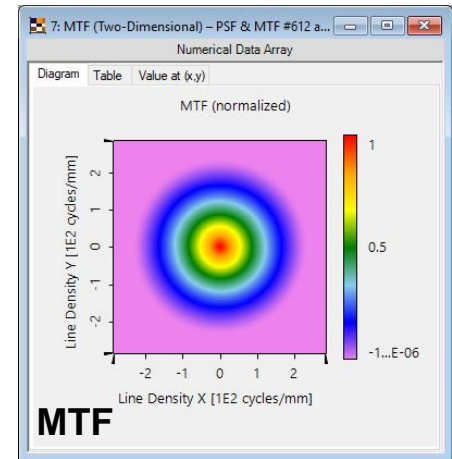
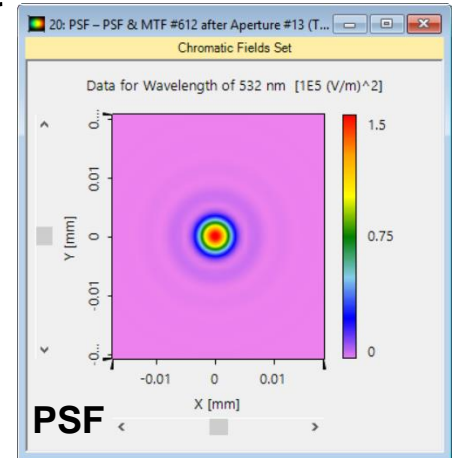
incoupling grating region

- center at (0, 0mm)
- size 2.7×2.7mm

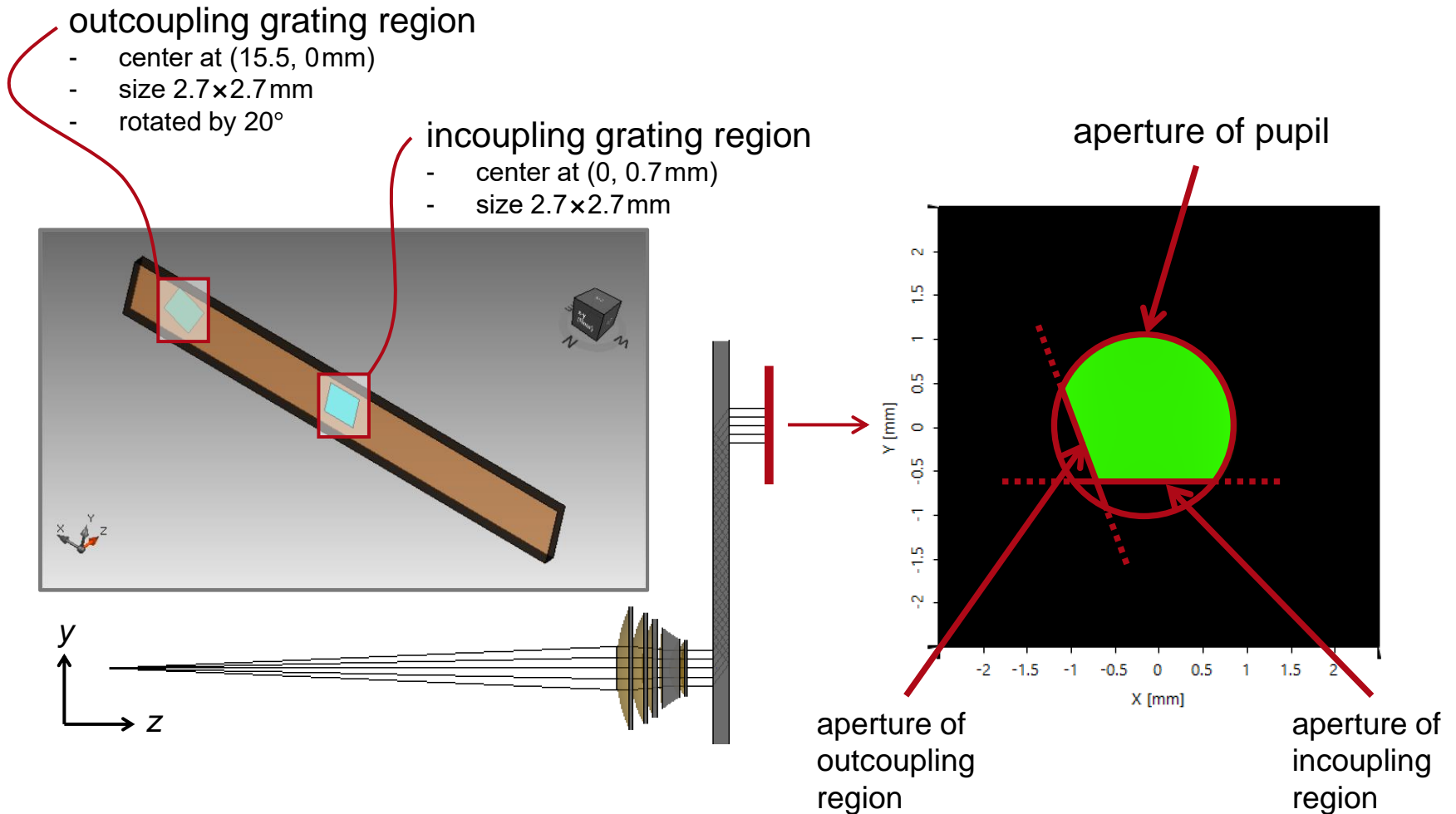


subsequent
imaging optics

image
plane



Results



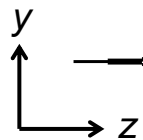
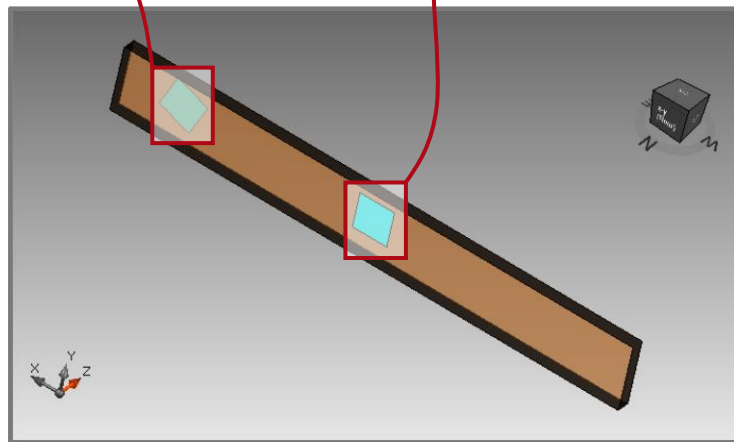
Results

outcoupling grating region

- center at (15.5, 0mm)
- size 2.7×2.7 mm
- rotated by 20°

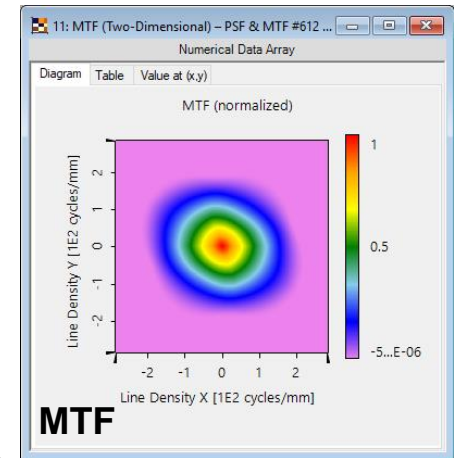
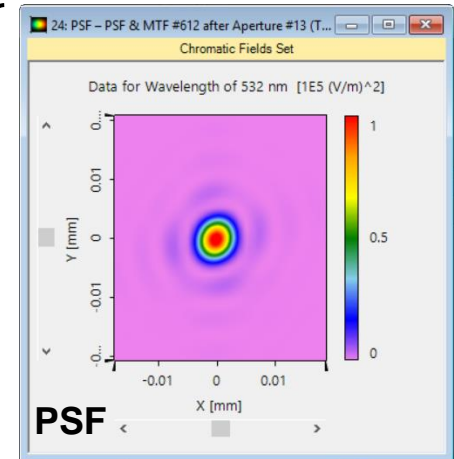
incoupling grating region

- center at (0, 0.7mm)
- size 2.7×2.7 mm

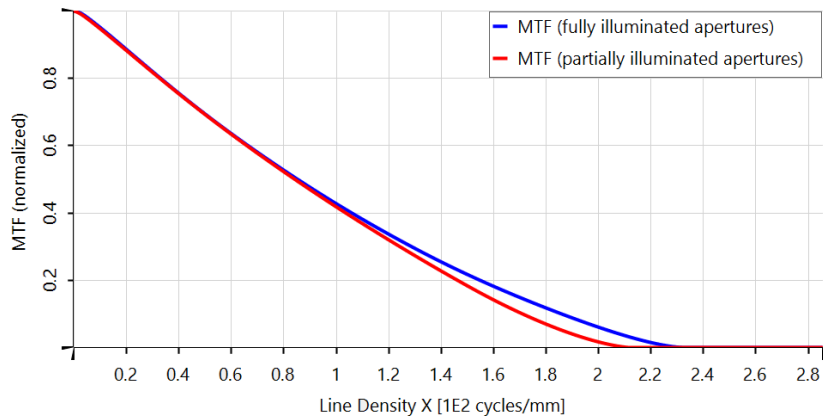


subsequent
imaging optics

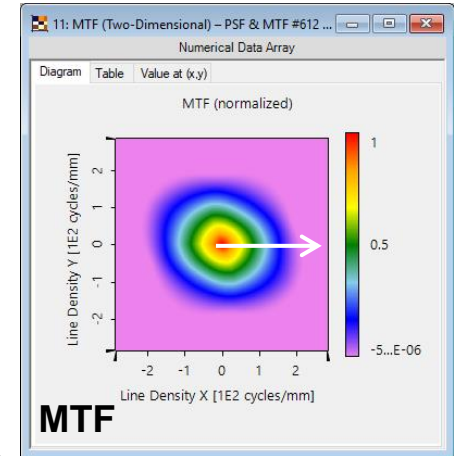
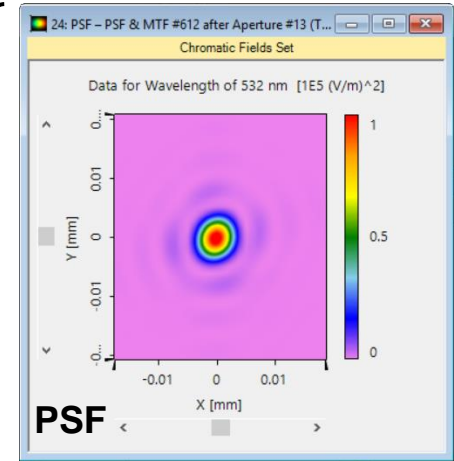
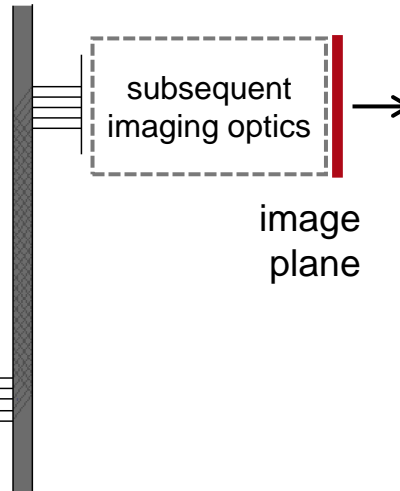
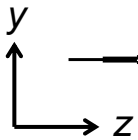
image
plane



Results



comparison between MTFs with full and partial illumination of the aperture



Document Information

title	Analysis of Folded Imaging System with Multiple Apertures
version	1.0
VL version used for simulations	7.3.0.41
category	Application Use Case
