WYROWSKI

VirtualLab FUSION

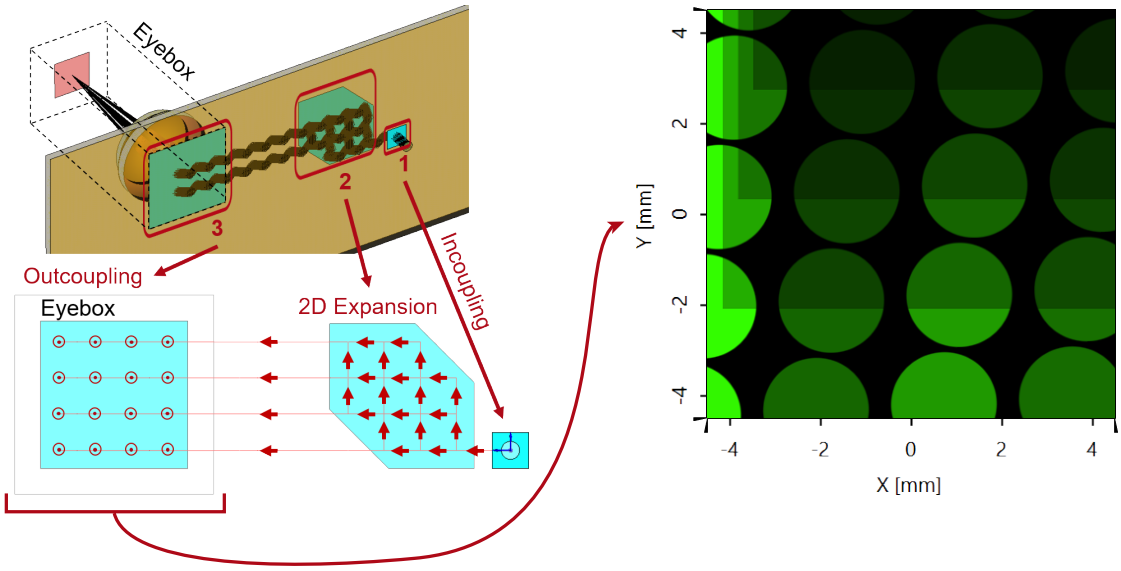
FAST PHYSICAL OPTICS SOFTWARE

Lightguide Devices for AR & VR Applications

The VirtualLab AR & VR Solution Package is the only commercially available single-platform software that provides physical-optics modeling of AR & VR lightguides: this includes all relevant effects like diffraction, polarization, interference and coherence. In its summer release 2019, VirtualLab Fusion comes with advanced design algorithms for lightguide devices as well.

Benefits in VirtualLab Fusion

- **Simulation of complete lightguide devices** for AR & VR applications within a single software platform
- Rigorous grating analysis with **Fourier modal method** (FMM, a.k.a. RCWA)
- Visualization of lightguide problems in the **spatial-frequency domain** (k-domain)
- **User-friendly design tools** for lightguide layout arrangement and grating parameter calculation



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All-in-One Lightguide Simulation Platform

- VirtualLab Fusion is the only commercial software platform that enables the modeling of complete lightguide devices.
- The modeling includes all relevant physical-optics effects, like polarization, coherence, and interference.
- Thanks to the Fourier modal method (FMM/RCWA), it also provides rigorous grating modeling.

Flexible Surface Region Configuration

- Regions can be flexibly defined on the lightguide surfaces, with spatially varying grating structures.
- VirtualLab Fusion can model grating regions either via user-defined efficiencies, or with real grating structures.
- With the help of the channel concept, the simulation of grating regions can be controlled as needed.

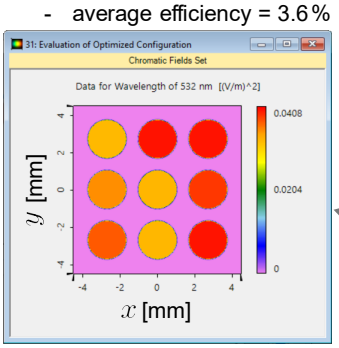
Rigorous Grating Modeling

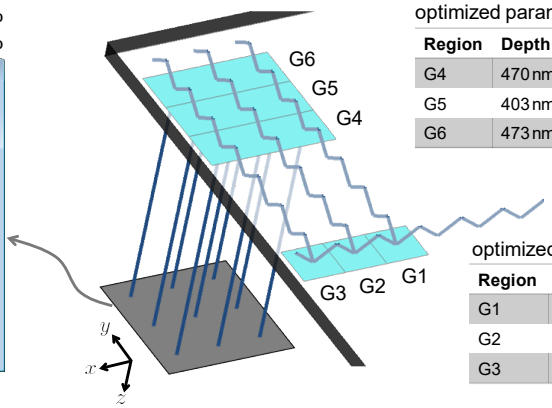
- Gratings used for lightguide coupling often have a relatively small period, and therefore rigorous modeling is required.
- The in-built Fourier modal method (FMM/RCWA) solves grating problems with fully vectorial field information.
- Not only the diffraction efficiency, but the possible polarization-dependent effects are all included.

Lightguide Layout and Structure Design

- A smart design tool for lightguide layout arrangement is provided.
- Segmentation of grating regions, and design of real grating parameters can now be done automatically for given parameters.
- Visualization of the lightguide problem in the spatial frequency domain (k-domain) is available.

- uniformity error = 10.5 %
- average efficiency = 3.6 %





optimized parameters

Region	Depth	Fill Factor
G4	470 nm	60.6 %
G5	403 nm	43.3 %
G6	473 nm	56.0 %

optimized parameters

Region	Depth	Fill Factor
G1	645 nm	57.6 %
G2	571 nm	43.2 %
G3	701 nm	60.3 %

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