

Online Training

VirtualLab Fusion Applications, Technology and Workflows

Grating Modeling and Design

Date and Time:

24 – 25 April 2023 | 16:30 – 21:00 (CEST)

26 – 27 April 2023 | 08:30 – 13:00 (CEST)

Note: This Training will be held twice to adapt to different time zones worldwide

Duration and Intended audience:

- 4 hours per day | 2 days in sum
- Additional 30 minutes technical check on first training day

Technical environment:

- The online training will be implemented with the platform “GoToMeeting”.
- Detailed technical instructions will be provided to participants in time before training.

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Gratings are the most widely applied diffractive optics elements in various optical systems. VirtualLab Fusion software provides the Fourier modal method (FMM a.k.a. RCWA) and the thin element approximation (TEA) for grating simulations. This interactive online training shows how to use the corresponding technologies from VirtualLab Fusion to solve practical grating modeling and design tasks for modern optics applications.

Learning Outcomes

- Learn how to construct the grating geometry and materials; understand the basic theory of the modeling technologies and their differences; use the software tools for grating analysis and design.
- Practice hands-on with selected rigorous modeling examples, including blazed grating, rectangular grating, slanted grating, holographic volume grating, and metagrating.
- Design workflow discussed along examples, like moth-eye anti-reflection grating, waveguide coupling grating, polarization-insensitive pulse compressor grating, and beam-splitting metagrating.

Agenda

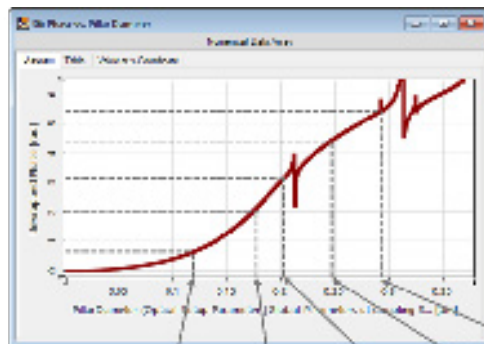
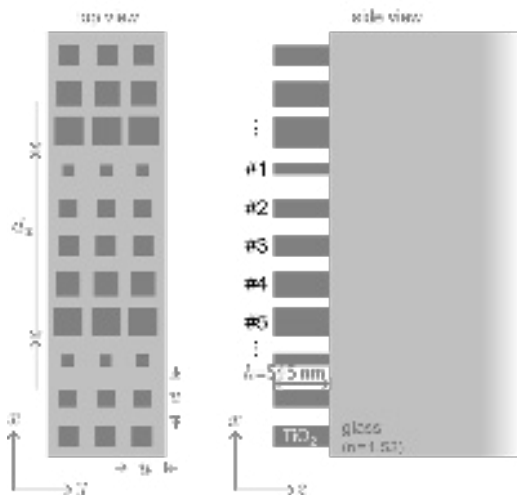
DAY I

- **Grating construction**
 - Field solvers for gratings (TEA & FMM)
 - Specific grating analysis tools
 - Rigorous modelling examples

DAY II

- **Gratings in optical systems**
 - Grating design/optimization
 - Metagrating examples

Please note: Halfway through each day there will be a short break. The organization of the time during the training will be adjusted on the spot, as it depends on the dynamics of the group on the day.



	N1	N2	N3	N4	N5
D	118nm	179nm	201nm	247nm	293nm
$k=0$	0.31	0.47	0.53	0.65	0.77
$\Delta\phi$	0.20 π	0.69 π	0.88 π	1.40 π	1.73 π

Selection of pillar diameters follows from P. Lalanne, *et al.*, Opt. Lett. 23, 1081-1083 (1998)