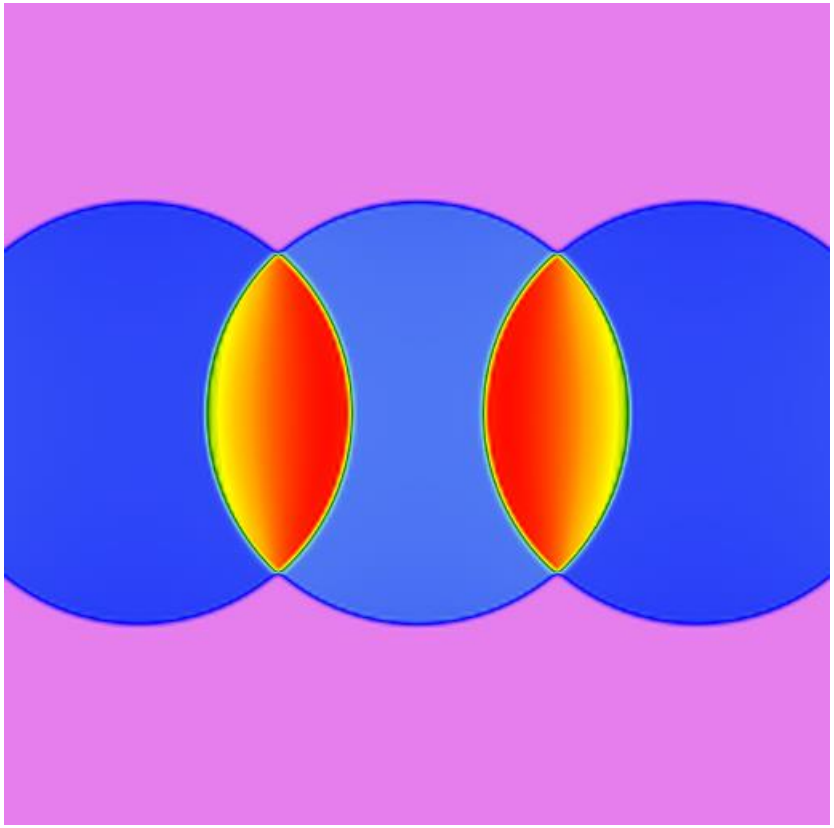
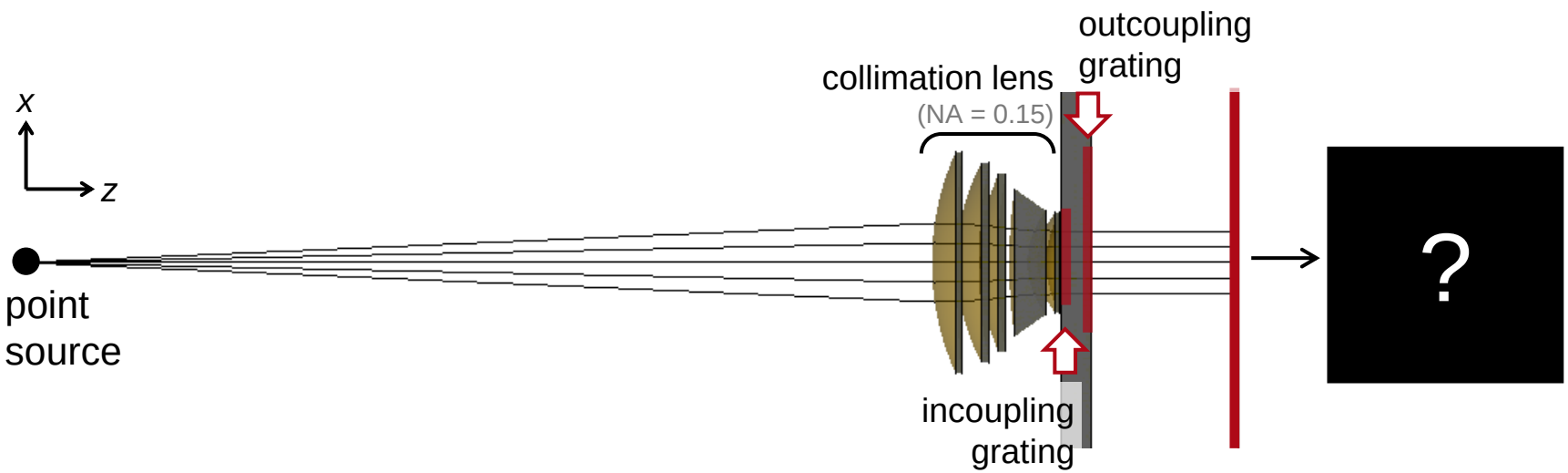
Light Propagation through Waveguide with In- & Outcoupling Surface Gratings

Abstract



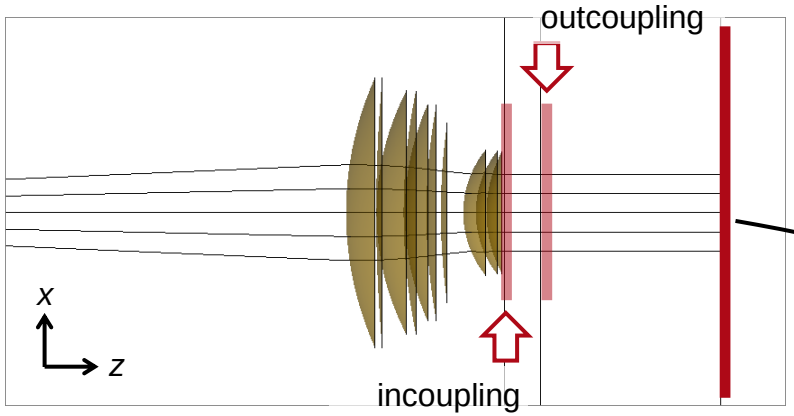
As one of the important issues for near-to-eye display design, propagation of light through waveguide with tailored in- and outcoupling gratings. With the region and channel concepts in VirtualLab, the in- and outcoupling gratings can be configured in a flexible way. Very importantly, light propagation through such waveguide structures can be modeled fast and accurately, with the coherence property taken into account.

Modeling Task



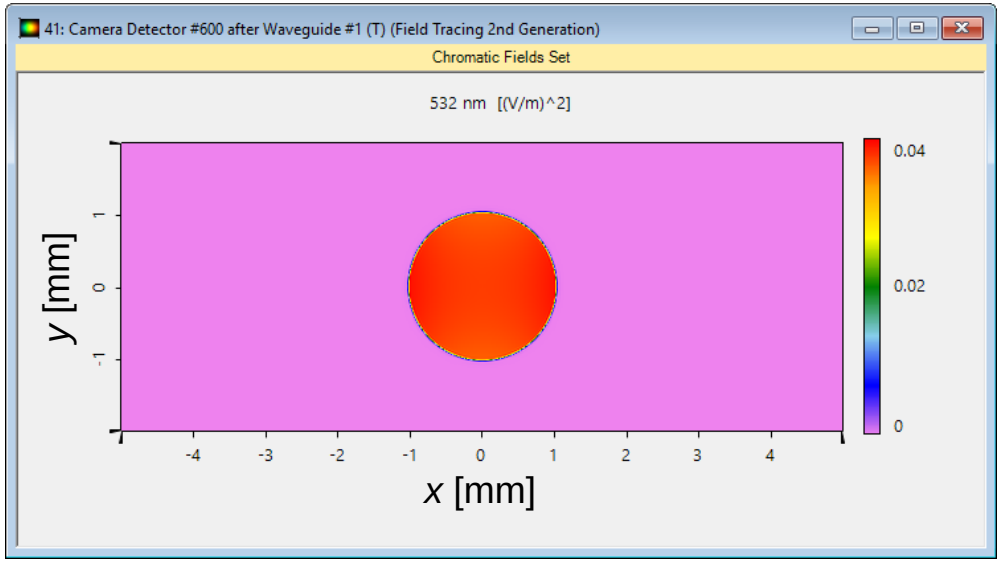
How to calculate the output field through waveguide with differently configured in- and outcoupling gratings?

Results

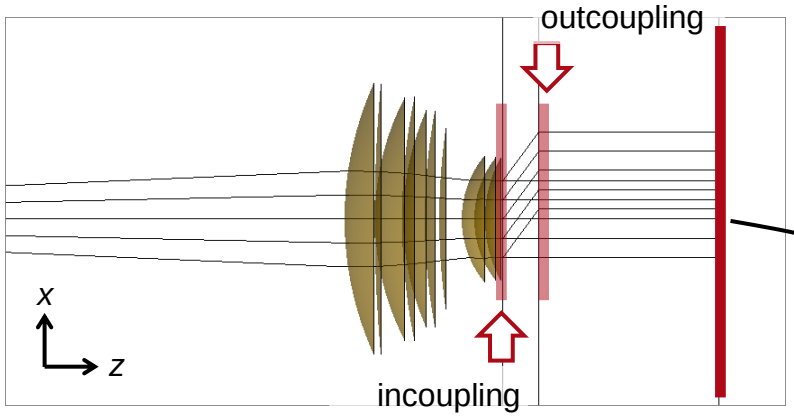


Region	Channel	Order	Efficiency
incoupling	+/+	T0	20 %
outcoupling	+/+	T0	20 %

Slight modulation in the intensity distribution is caused by lens effects.

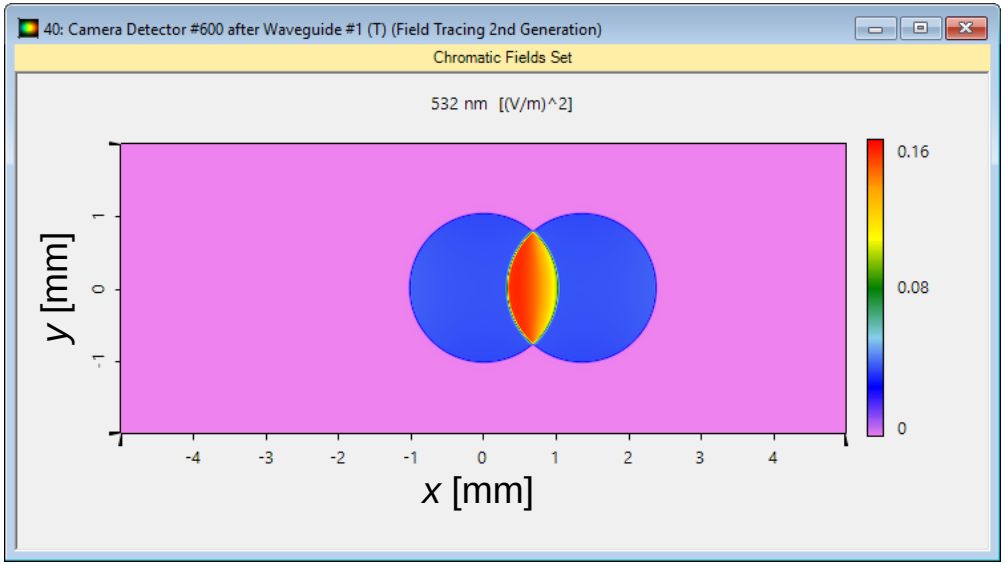


Results

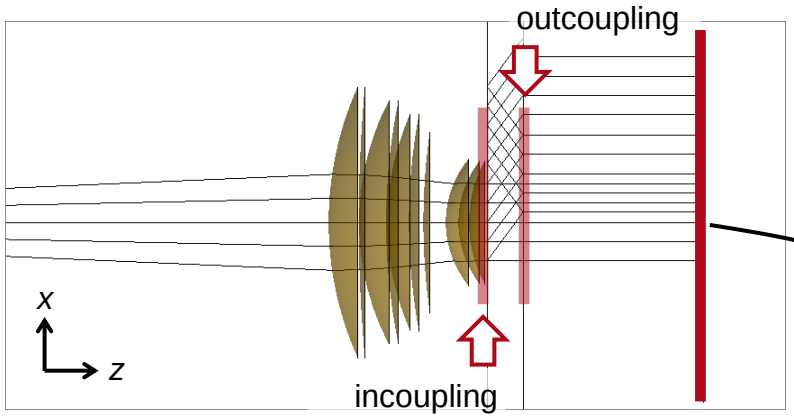


Region	Channel	Order	Efficiency
incoupling	+/+	T0	20 %
	+/+	T+1	20%
outcoupling	+/+	T0	20 %
	+/+	T-1	20%

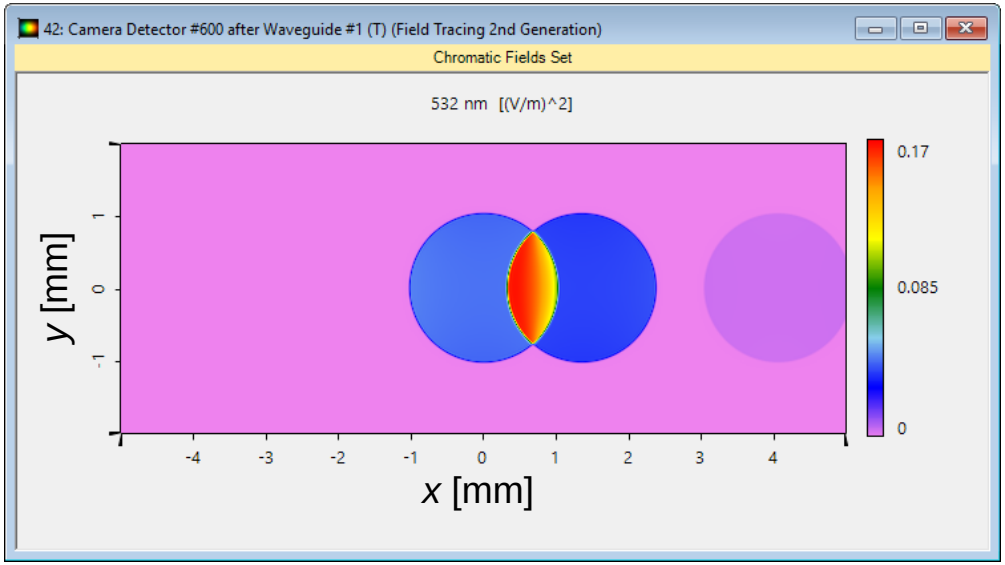
Coherence among diffraction orders is taken into account and it leads to interference.



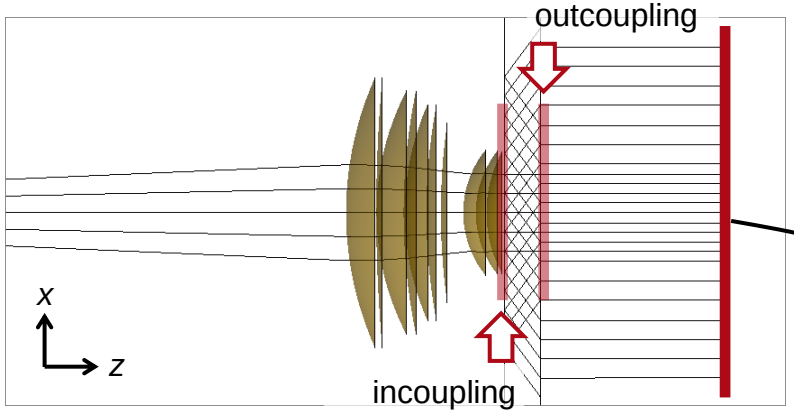
Results



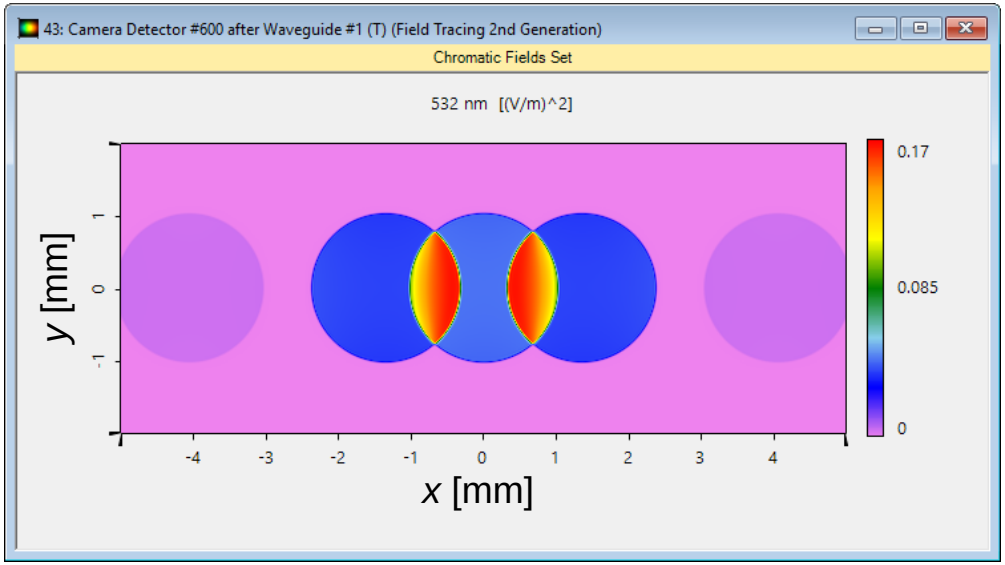
Region	Channel	Order	Efficiency
incoupling	+/+	T0	20 %
	+/+	T+1	20%
	-/+	R0	10%
outcoupling	+/+	T0	20 %
	+/+	T-1	20%
	+/+	R0	10%



Results



Simulation of light propagation through waveguide with tailored in- and outcoupling gratings, with coherence property taken into account, takes 3 seconds only.



Region	Channel	Order	Efficiency
incoupling	+/+	T0	20 %
	+/+	T+1	20%
	-/+	R0	10%
	+/+	T-1	20%
outcoupling	+/+	T0	20 %
	+/+	T-1	20%
	+/+	R0	10%
	+/+	T+1	20%

Document Information

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