Meta-surface beamshaper
Project example

29/12/2023

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Enlightened Planar Optics
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Problem statement

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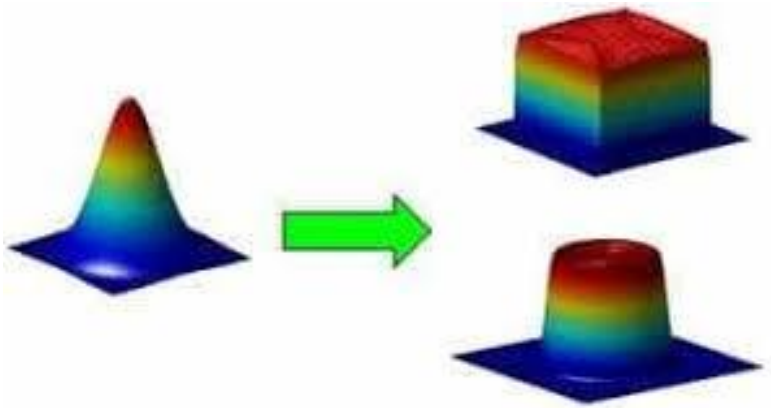
- **Beam shaping optics** are important for improving laser manufacturing, optical sensor performance, Time-of-Flight (TOF) depth sensing
- Beam shaping optics need:
  - **Control** output light shape
  - **Single component** (robust + lower cost)
  - **Robust** / High damage threshold (laser manufacturing)
- **PlanOpSims task** was to **design a meta-surface** top-hat beam shaper for an incident Gaussian beam



Design project

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Specifications

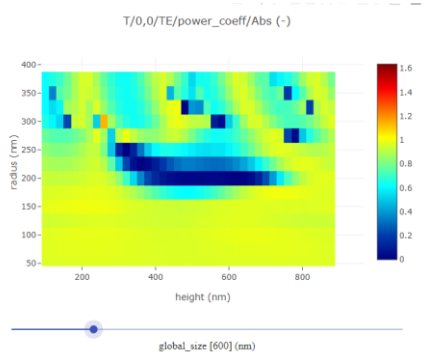
1) Input beam: 500μm Gaussian beam with focus plane on metacomponent

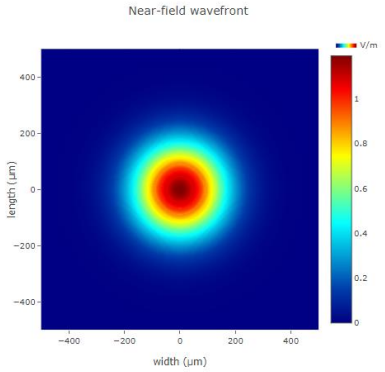
2) Output: 500μm wide square top-hat **imaged at 5mm behind metacomponent***

Meta surface design

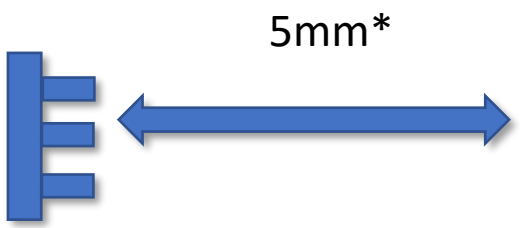
1) Meta-atom optimization PlanOpSim meta-cell software SiO_2 + TiO_2 pillars

2) Meta-surface wavefront shaping & analysis simulation

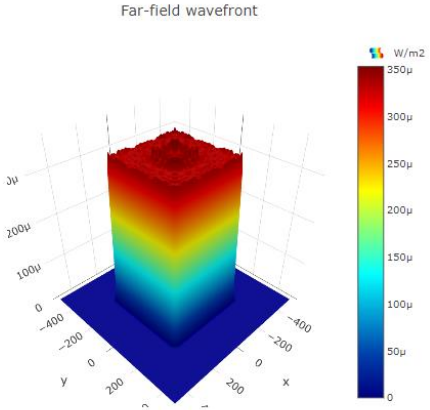




GB input



Meta-surface Beamshaper



Square tophat output