



Wafer scale 12" metasurface grating

Meta-structures with feature size from 100 – 300 nm on
full 12" Si-wafer for nano-imprint replication

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Description

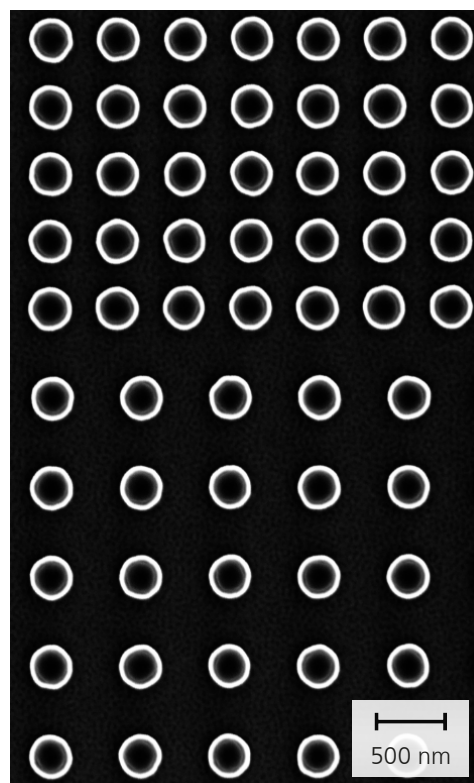
The wafer scale 12" metasurface grating utilizes the principle of effective media in order to realize the optical function of a blazed grating. Thus, it consists of sub-wavelength sized pillars with minimum dimensions of 100 nm. The grating area with 280 mm diameter covers almost the full 12" substrate. The Master serves for nano-imprint replication processes.

Parameters

- The meta-master possesses the optical function of a blazed grating with a pitch of 12.1 μm
- The effective medium is realized by 2D features with round corners (see image on the right)
- Minimum feature size of 100 nm and minimum pitch of 200 nm
- Grating area with 280 mm diameter

Technology

The grating is realized by electron beam lithography utilizing character projection. The writing time is about 36 h, which is an improvement by a factor 5000 compared to standard Variable Shaped Beam lithography.



Profilometrical measurement of surface

Cover: Photograph of the 12" sized sample of the meta-master

Top: SEM image of the 2D sub-wavelength structure

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