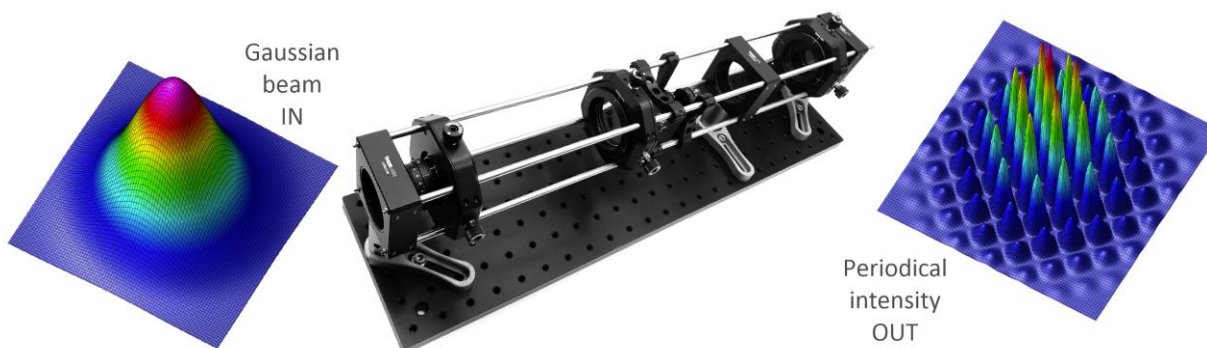


4 Beam Interference Module

An external module for the transformation of uniform laser intensity to periodical pattern



4BIM

FUNCTIONS

Transformation of the conventional laser beam with Gaussian intensity profile to periodically modulated intensity patterns

A large variety of periodical intensity patterns

Compatibility with most ultra-short lasers

APPLICATIONS

Hierarchical micro/nano-structuring for super-hydrophobic surface creation

Light-harvesting amplification induced by periodical microstructure

OVERVIEW

The main and most prominent application of periodically modulated laser interference intensity profile is functional surface structuring at a high processing rate. The hierarchical micro/nanostructures can be created which has superb functional properties like the self-cleaning effect and absorption enhancement by light trapping.

TECHNICAL SPECIFICATIONS

4 Beam Interference Module	4BIM
Number of interfering laser beams	2, 3, and 4
Interference period	1 μm
Orientation control of half-wave phase plates for each interfering beams	0° - 180°, step 2°
The controlled polarization direction of each interfering beam	0° - 360°, step 4°
Dimensions (xyz)	60 × 15 × 15 cm ³
Operating ambient temperature	15°C to 30°C

REQUIREMENTS FOR AN EXTERNAL LASER SOURCE

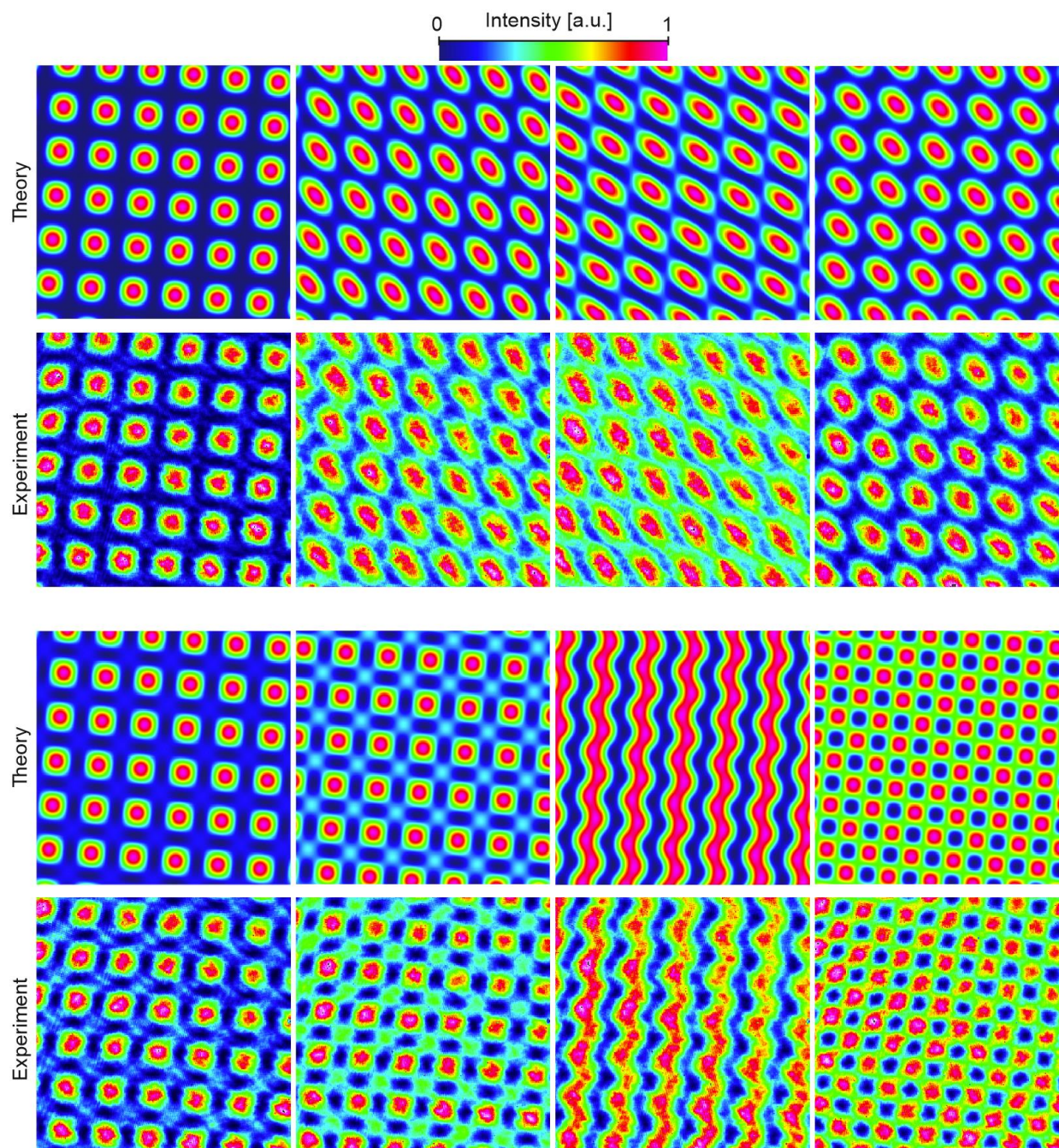
4 Beam Interference Module	4BIM
Wavelength of irradiation	532 nm
Incoming beam radius at level $1/e^2$	2 mm - 4 mm
Pulse repetition rate	0 Hz to 100 MHz
Gaussian beam quality	$M^2 < 1.3$
The damage threshold of optics	10 J/cm ² at 532 nm, 10 ns, 20 Hz

CONTROLS

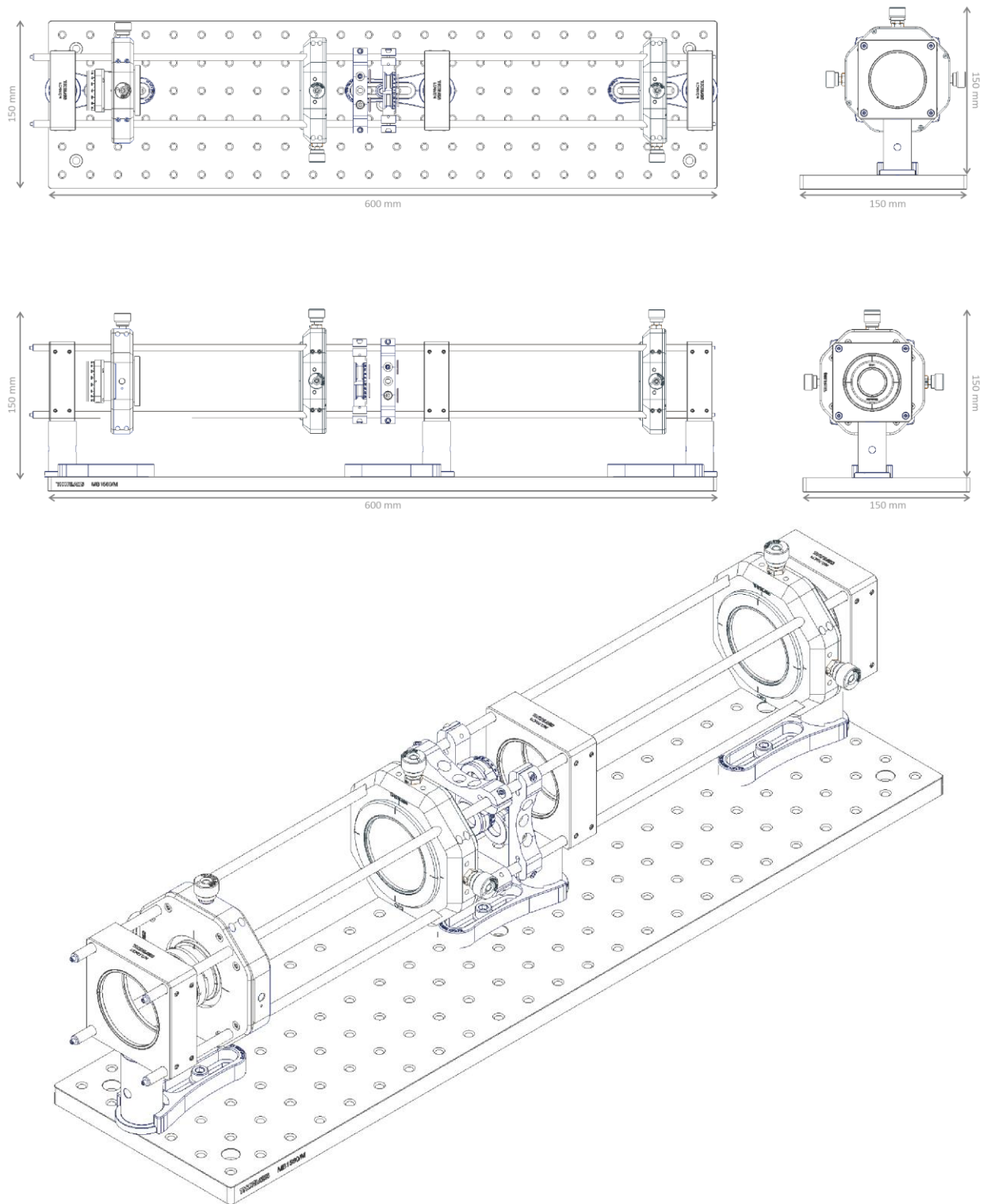
Manual control of polarization direction

The intensity pattern characteristics are controlled by manually adjusting the polarization vector orientation control of each beam by controlling the orientations of half-wave phase plates. The precision optomechanical components are selected for the finest tuning of the periodically modulated interference intensity distribution.

PERFORMANCE



4BIM intensity patterns achieved by manual control of polarization direction for each interfering beams



4BIM