100 μm 厚 同性 LN;
光强 XZ 剖面;

Real space - X [mm]

-0.03 -0.02 -0.01 0.0 0.01 0.02

Propagation distance - Z [mm]

0.02 0.04 0.06 0.08 0.1

AST - U$_{1/VH}$_0.0mm_XZ_intensity

同性 LN

XZ 剖面

总光强 I

f$_0$ = 1,5,10,15,20,25,30 μm

2.0·10^5 4.0·10^5 6.0·10^5 8.0·10^5 1.0·10^6 1.2·10^6 1.4·10^6

Intensity distribution - |E|^2 [W/m^2]

2
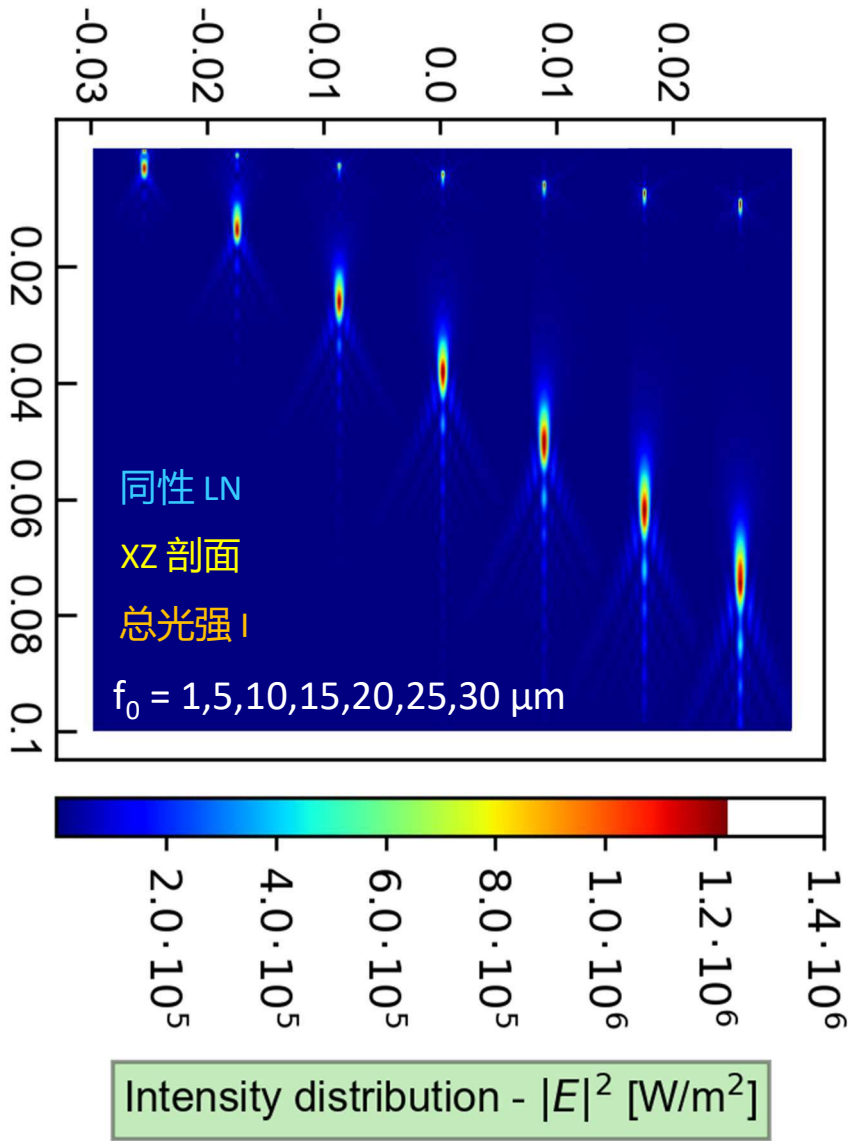
Adaptive aberration compensation for three-dimensional micro-fabrication of photonic crystals in lithium niobate

H 偏 高斯 → 各向同性;
n = 2.2291; f$_0$ = 30 μm;
θ = 58.36 °; N.A. = 0.85;
λ = 800 nm; ω$_0$ = 250 nm;

Benjamin P. Cumming,[1] Alexander Jesacher,[2] Martin J. Booth,[3,4] Tony Wilson,[3] and Min Gu[1,*]

nominal focal position

(a)

Axial Position (μm)

0 5 10 15

d = 0 μm   d = 7.5 μm   d = 15 μm

-2 0 2   -2 0 2   -2 0 2

Radial Position (μm)

(b)

Axial Position (μm)

0 5 10 15

0 0.5 1
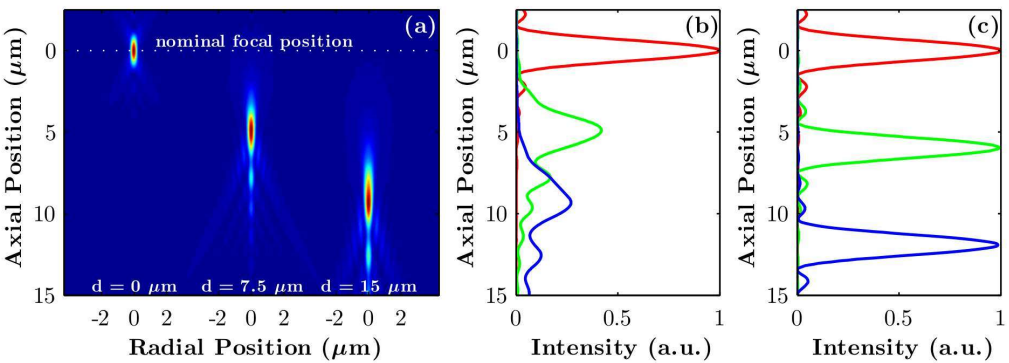
Intensity (a.u.)

(c)

Axial Position (μm)

0 5 10 15

0 0.5 1

Intensity (a.u.)

Fig. 1. (a) Calculated focal intensity distribution when a plane wave is focused into depths of 0 μm, 7.5 μm and 15 μm in LiNbO$_3$ without compensation of the refractive-index mismatch aberration. (b) Comparison of the intensity along the axial direction in (a). (c) Intensity along the axial direction in (a) when the aberration is compensated.

f=150 dichroic 3D stage

CCD

LED

objective

f=250

f=300

SLM

laser λ/2 polarizer atten. f=-50 f=300

n$_1$

n$_2$
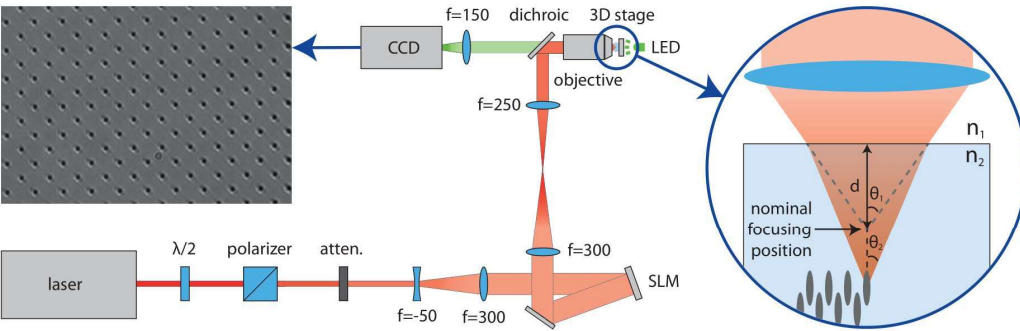
d θ$_1$

nominal focusing position

θ$_2$

Fig. 2. Experimental set-up used for DLW with a SLM. The insets show a typical image of a plane in a fabricated PhC (left) and the focusing conditions within the fabrication medium when n$_2$ > n$_1$ (right).