**Supporting information**

**Supplementary Material S1**:  Intensity distribution profiles of the incident azimuthally (left) or radially (right) polarized beam in the focal region. The profiles were calculated for a 1064 nm incident beam corresponding to the two different objectives employed in this work with numerical apertures of respectively 0.9 in air (top) and of 1.3 in oil (bottom)
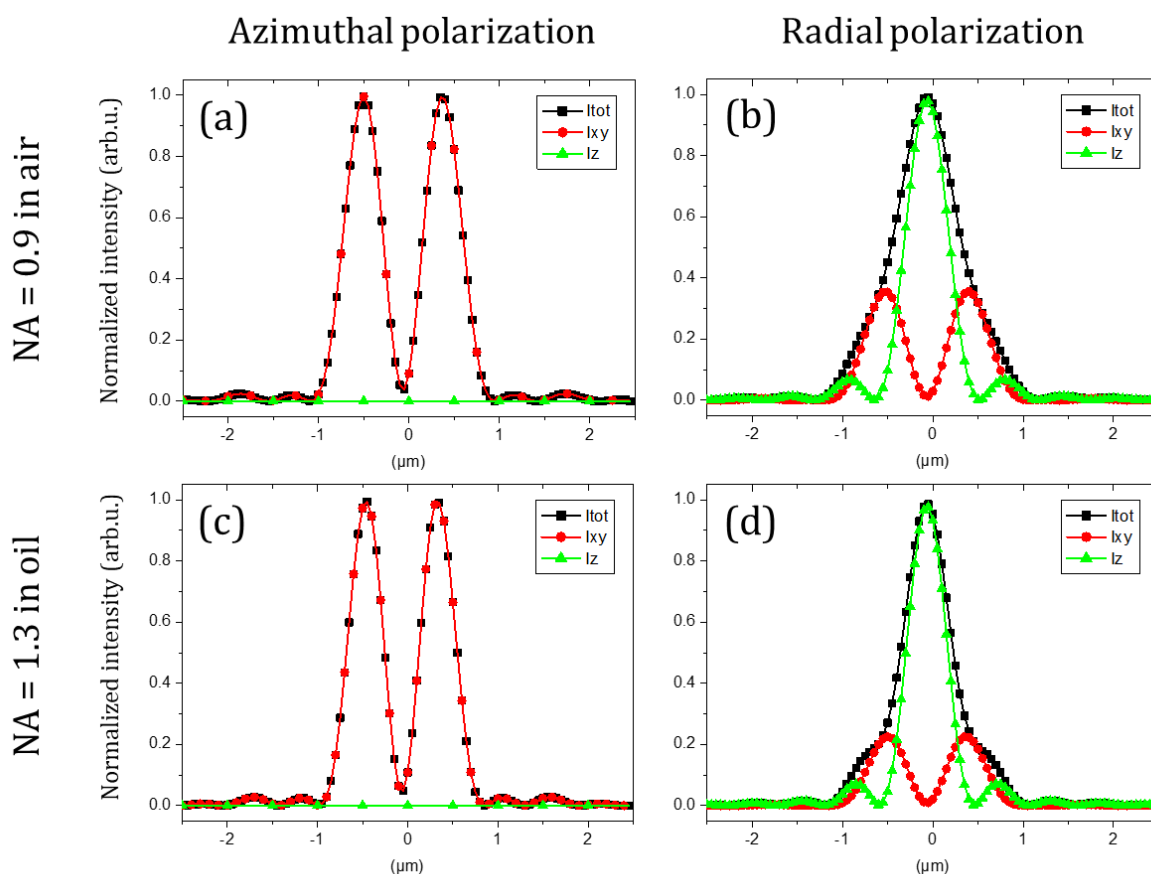
**Supplementary Material S2**: Schematic of Δn estimation taking into account topology

corrections.
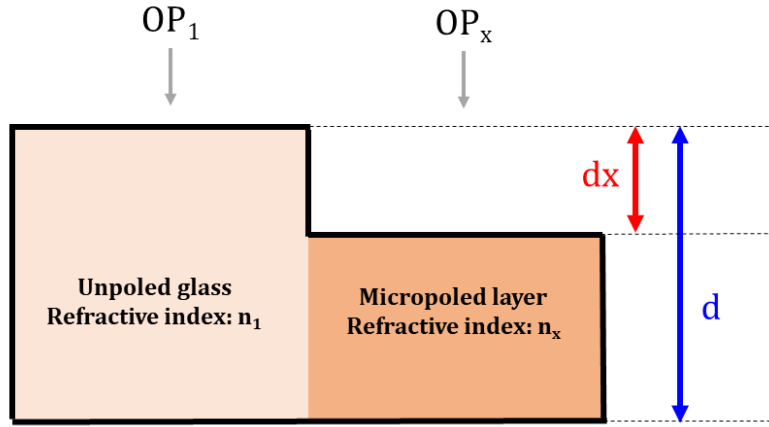


$d_x$ : topological depth (measured by AFM)

d >>> $d_x$ and can be considered to be 2.5 µm (poled layer measured by SHG

microscopy) [38]

$n_1$ = 1.83 (measured by the Brewster angle) [38]

$OP_1 = n_1.d$

$OP_x = n_x.(d-d_x) + n_{air}.d_x = n_1.(d-d_x) + d_x$

$OPD = OP_x - OP_1$

Then:

$$n_x = \frac{OPD - dx + n_1.d}{d - dx}$$

And:

$\Delta n = n_x - n_1$

| Sample | G-70/4 | G-4/4 |
|---|---|---|
| $n_1$ | 1.83 | 1.83 |
| d | 2.5 µm | 2.5 µm |
| $d_x$ (Figure 5) | 100 nm | 75 nm |
| OPD (Figure 6) | 60 nm | 45 nm |
| $n_x$ | 1.839 | 1.837 |
| Δn | 0.009 | 0.007 |