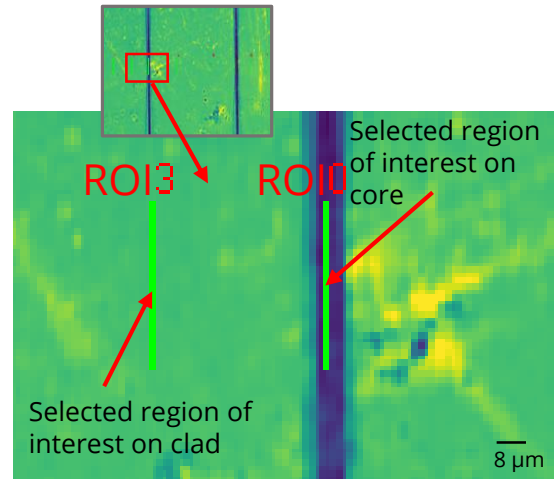


Refractive Index Measurement of Waveguides BY IMAGING ELLIPSOMETRY

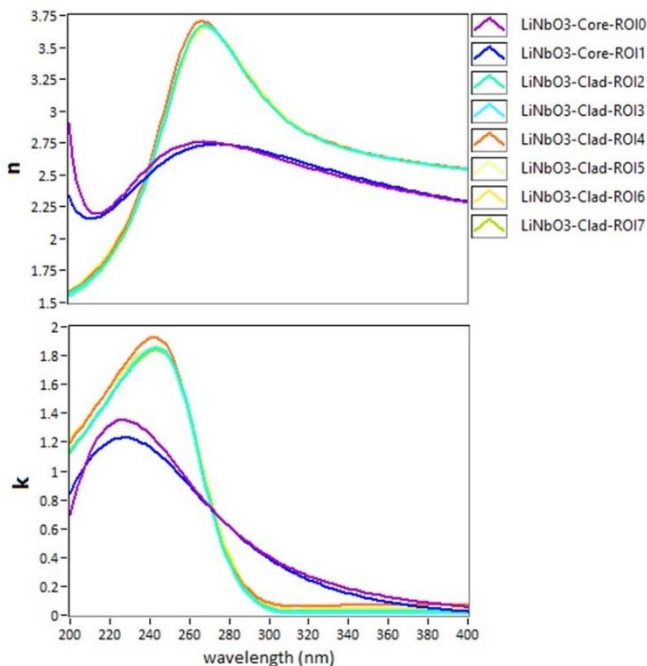
SAMPLE AND SETUP

The dispersive refractive index needs to be measured on **8 μm** wide waveguides of LiNbO_3 . Additionally, the thickness of an SiO_2 layer is to be determined on the waveguides and on clad region.

Imaging ellipsometry with the **nanofilm_ep4** offers highest lateral ellipsometric resolution down to **1 μm** . It combines the sub-nanometer sensitivity for thickness and precise spectral refractive index measurements of ellipsometry with the benefits of magnification and high lateral resolution of optical microscopy.



Psi map at 250 nm
(Courtesy of Samuel Margueron, FEMTO-ST)



MEASUREMENT

Spectral micro mapping

Spectral micro-maps of Delta and Psi were recorded from 200 nm to 400 nm. Spectral Delta and Psi data were extracted for multiple regions (average of 30 pixel) on the waveguides and beside them. Dispersive refractive index and thickness of top SiO_2 layer are fitted, using the EP4 optical model software.

RESULTS

- SiO_2 thickness on Core: 3 nm / on Clad: 113 nm
- Difference of dispersive refractive index of core and clad region clearly visible
- Good reproducibility of results between different regions of the same kind

APPLICATIONS

- Spectral refractive index measurements on micron sized waveguides (wavelength 190-2700 nm) with a difference between clad and core of down to 0.001
- Thin layers on micron sized structures
- Integrated photonics