

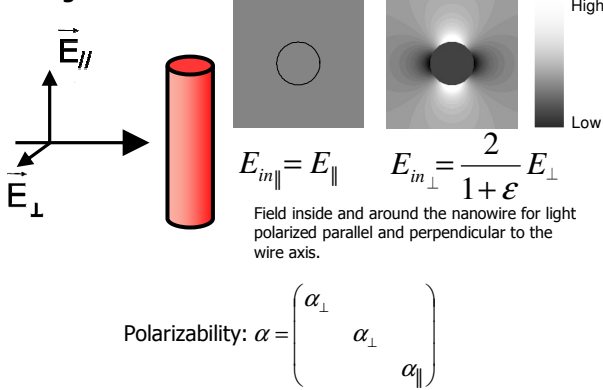
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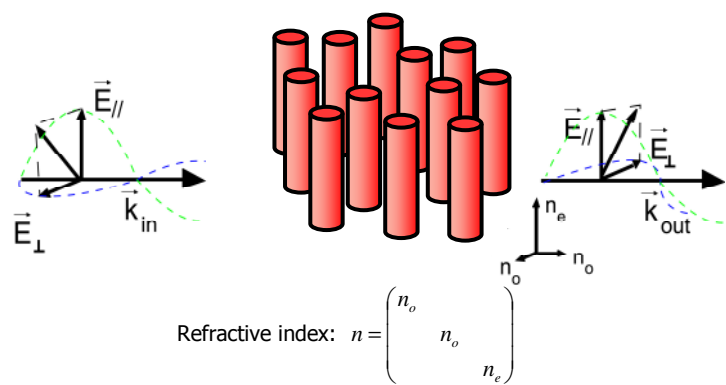
Introduction

Single wire:



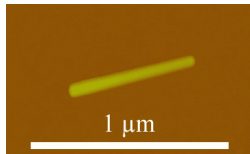
Polarization anisotropy: different polarizability for incident light polarized parallel and polarized perpendicular to the wire axis due to shape anisotropy.

Ensemble of wires:

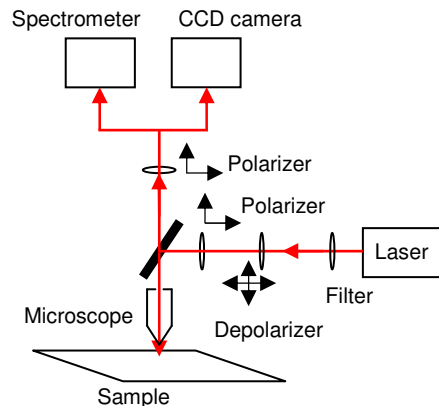


Form birefringence: different refractive indices for polarization directions perpendicular and parallel to the nanowire axis due to shape anisotropy and the alignment of the nanowires.

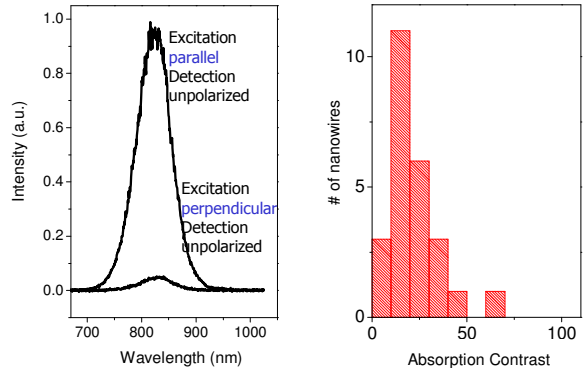
Polarization anisotropy of a single nanowire



AFM image of an InP nanowire



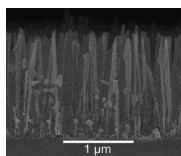
Absorption anisotropy:



Absorption anisotropy: InP nanowires show a high absorption contrast $C_{abs} = \frac{I_{\parallel abs}}{I_{\perp abs}}$

The average absorption contrast is 21. The variations are due to different diameters of the nanowires.

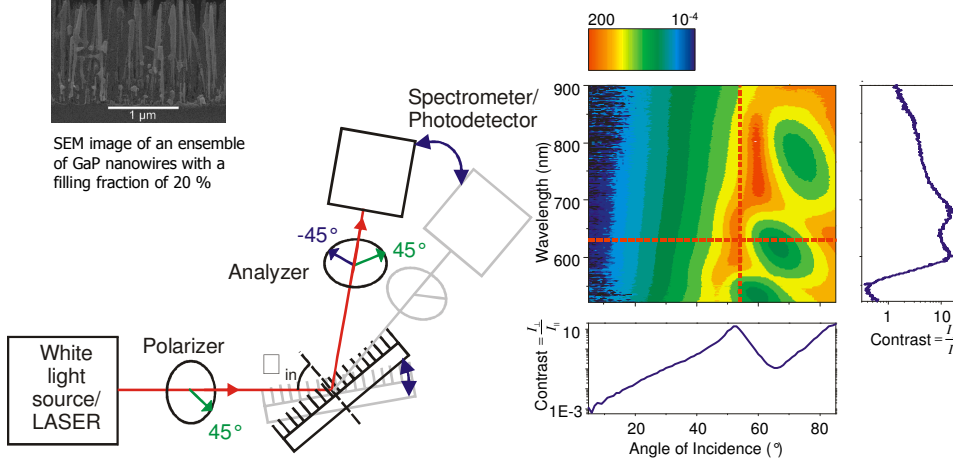
Birefringence of ensembles of nanowires



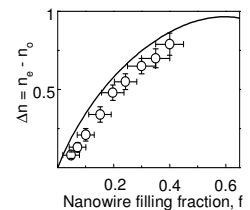
SEM image of an ensemble of GaP nanowires with a filling fraction of 20 %

Reflection contrast measurement:

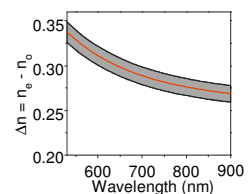
We can obtain Δn from the reflection contrast.



Filling fraction dependence:



Wavelength dependence:



Optical Birefringence: World-record birefringent material of $\Delta n = 0.8$ for a filling fraction of 40 %