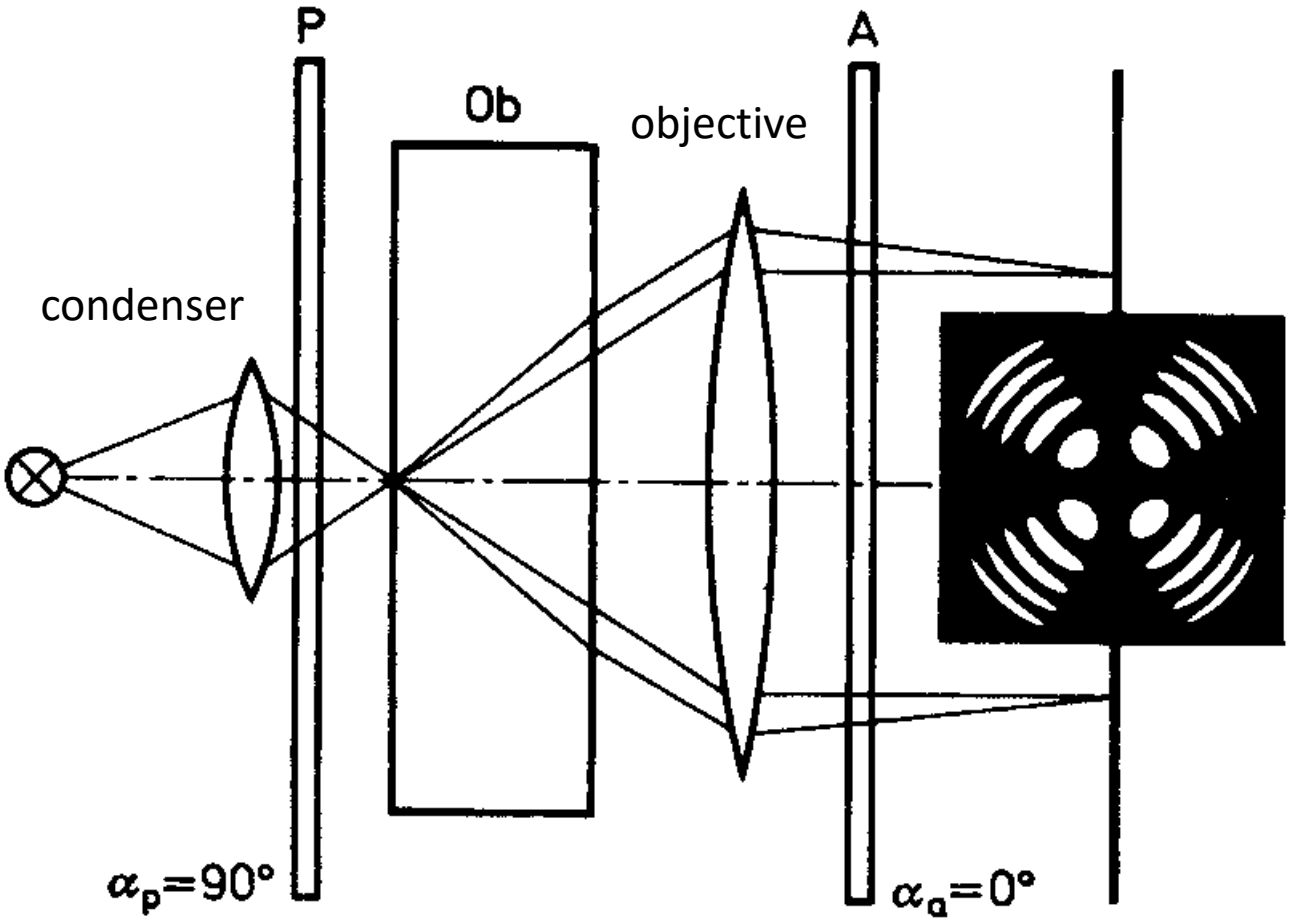
Conoscopy

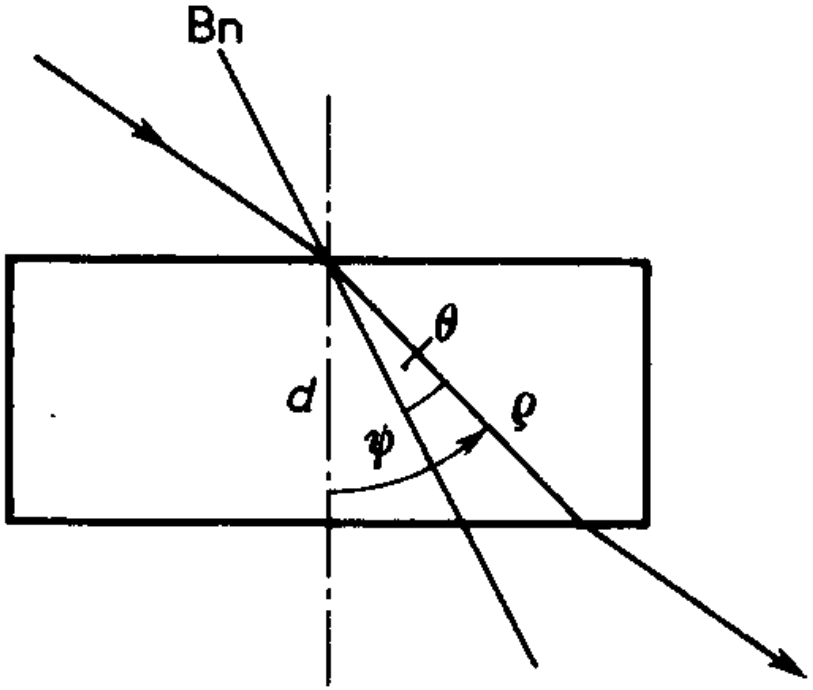
Theoretical background

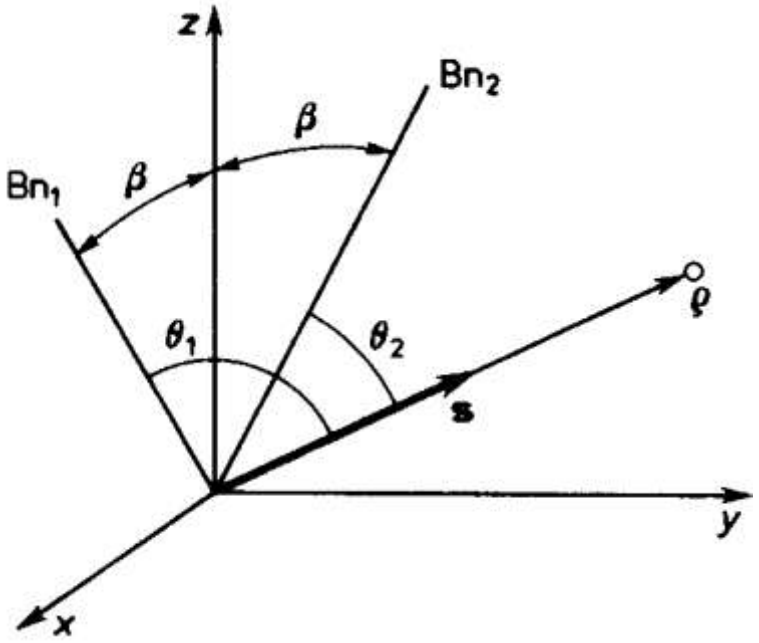


Theoretical background

$$R = \rho(n_o - n_e)\sin^2\theta = d(n_o - n_e)\sin^2\theta/\cos\psi$$

$$R = \rho(n_z - n_x)\sin\theta_1\sin\theta_2 = d(n_z - n_x)\sin\theta_1\sin\theta_2/\cos\psi,$$





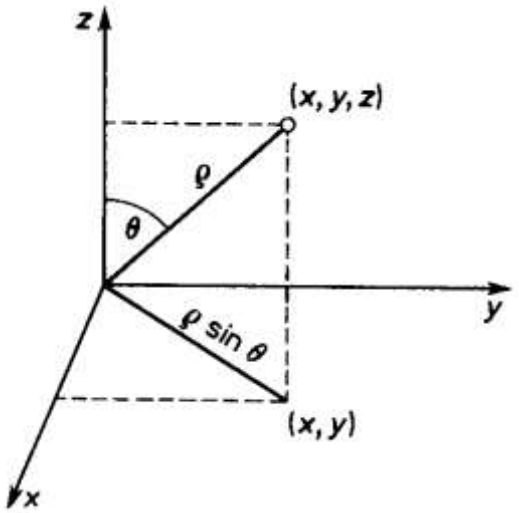
Theoretical background

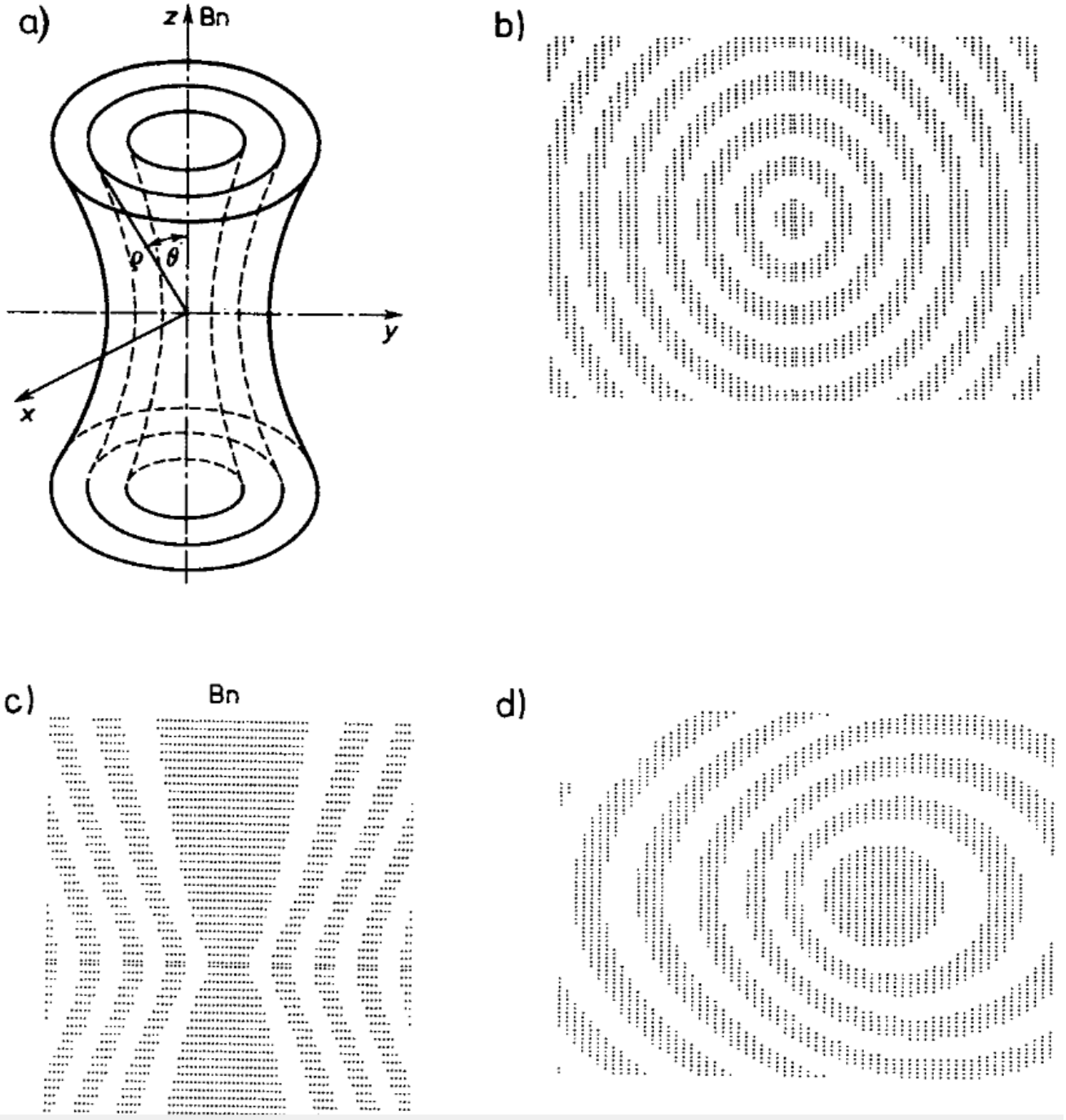
A polariscopic equation adjusted for conoscopic setup:
(for uniaxial setup)

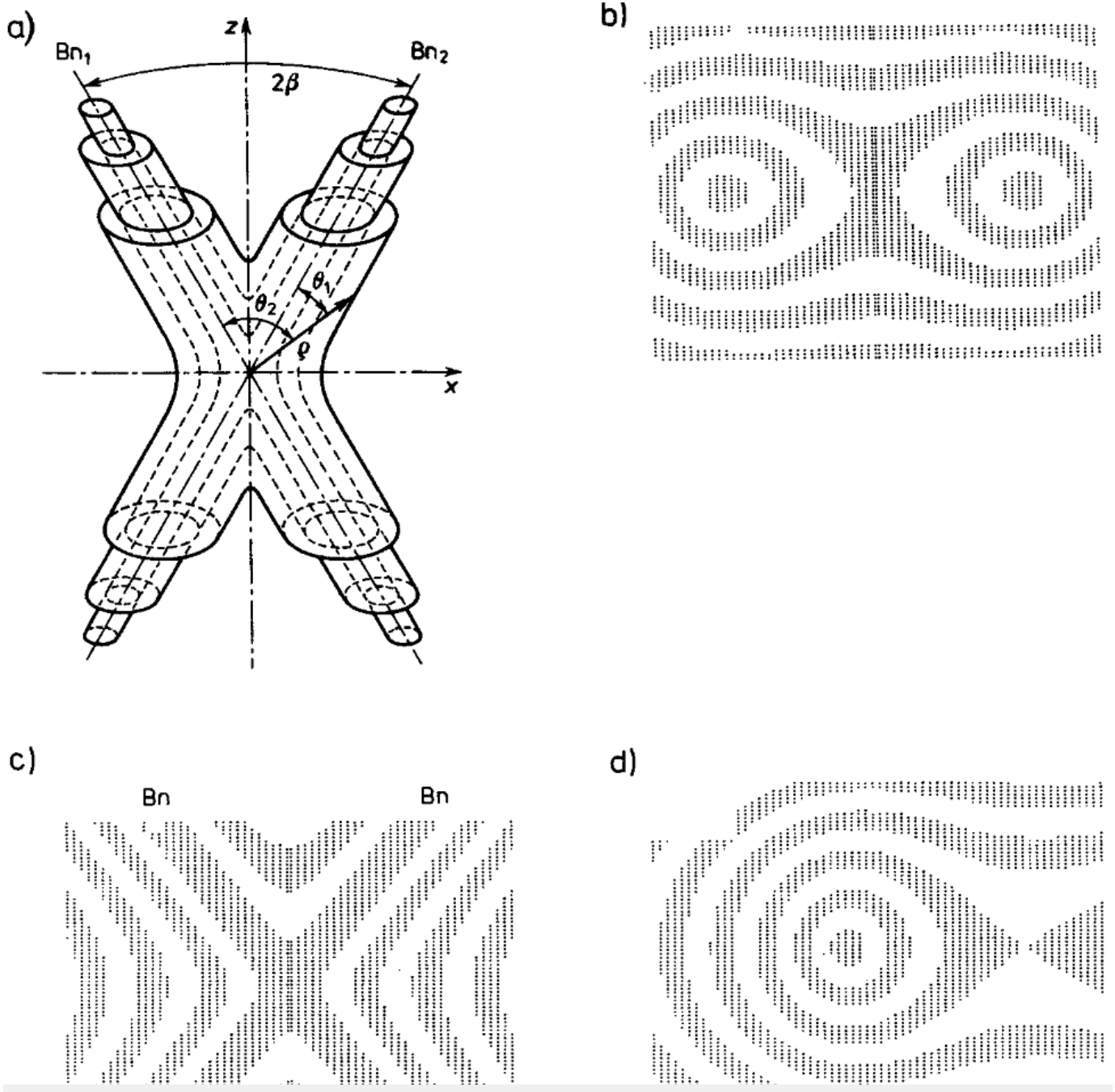
$$I = I_{\max} \sin^2 2\alpha \sin^2[(\pi\rho/\lambda)(n_o - n_e)\sin^2\theta]$$

(for biaxial setup)

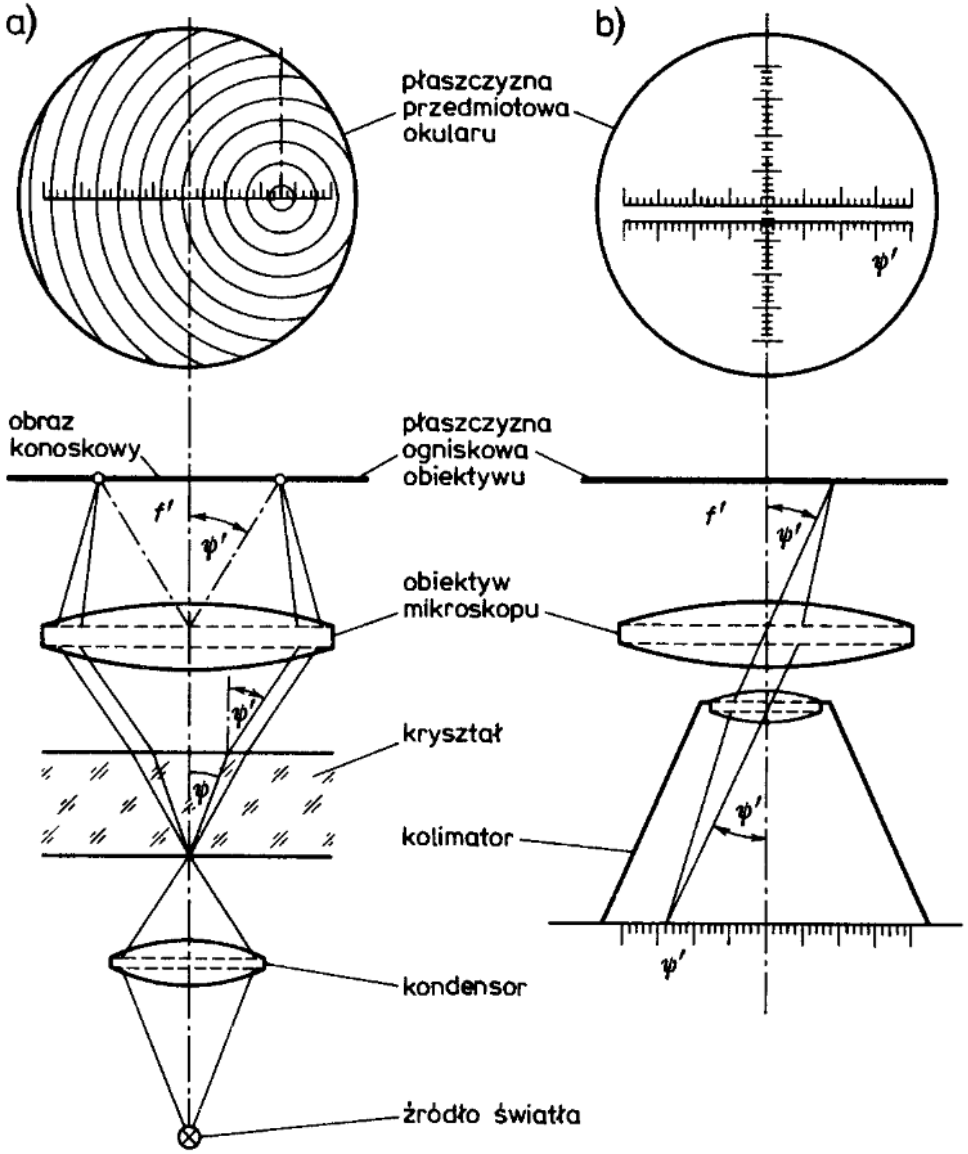
$$I = I_{\max} \sin^2 2\alpha \sin^2[\pi\rho/\lambda)(n_z - n_x)\sin\theta_1 \sin\theta_2]$$

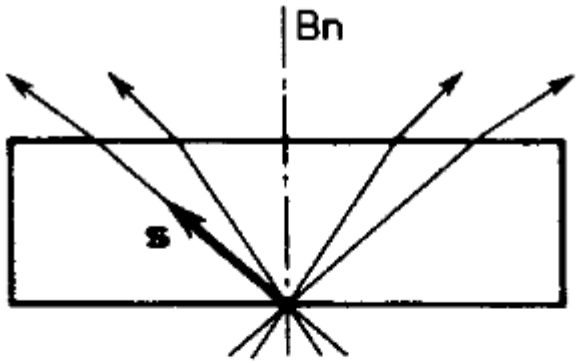


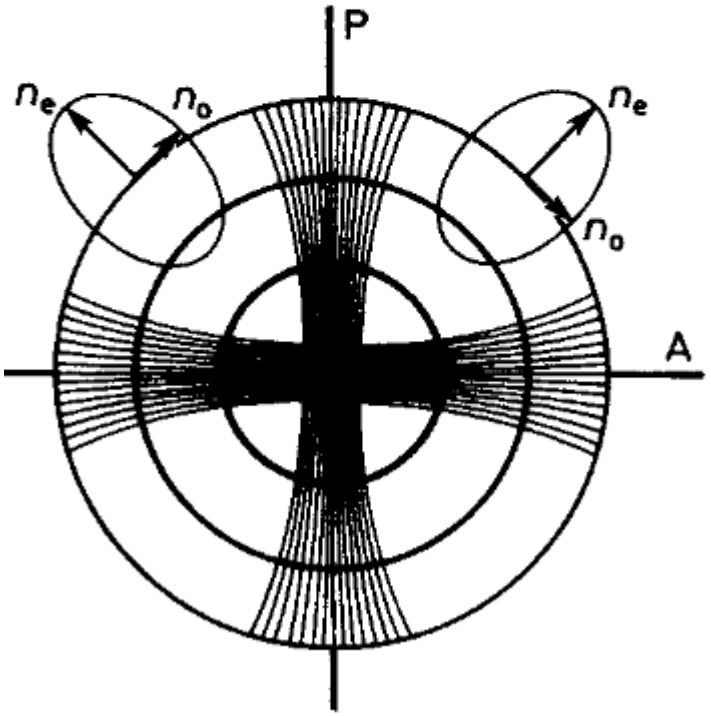

a)
z
Bn
φ
θ
y
x
b)
c)
Bn
d)

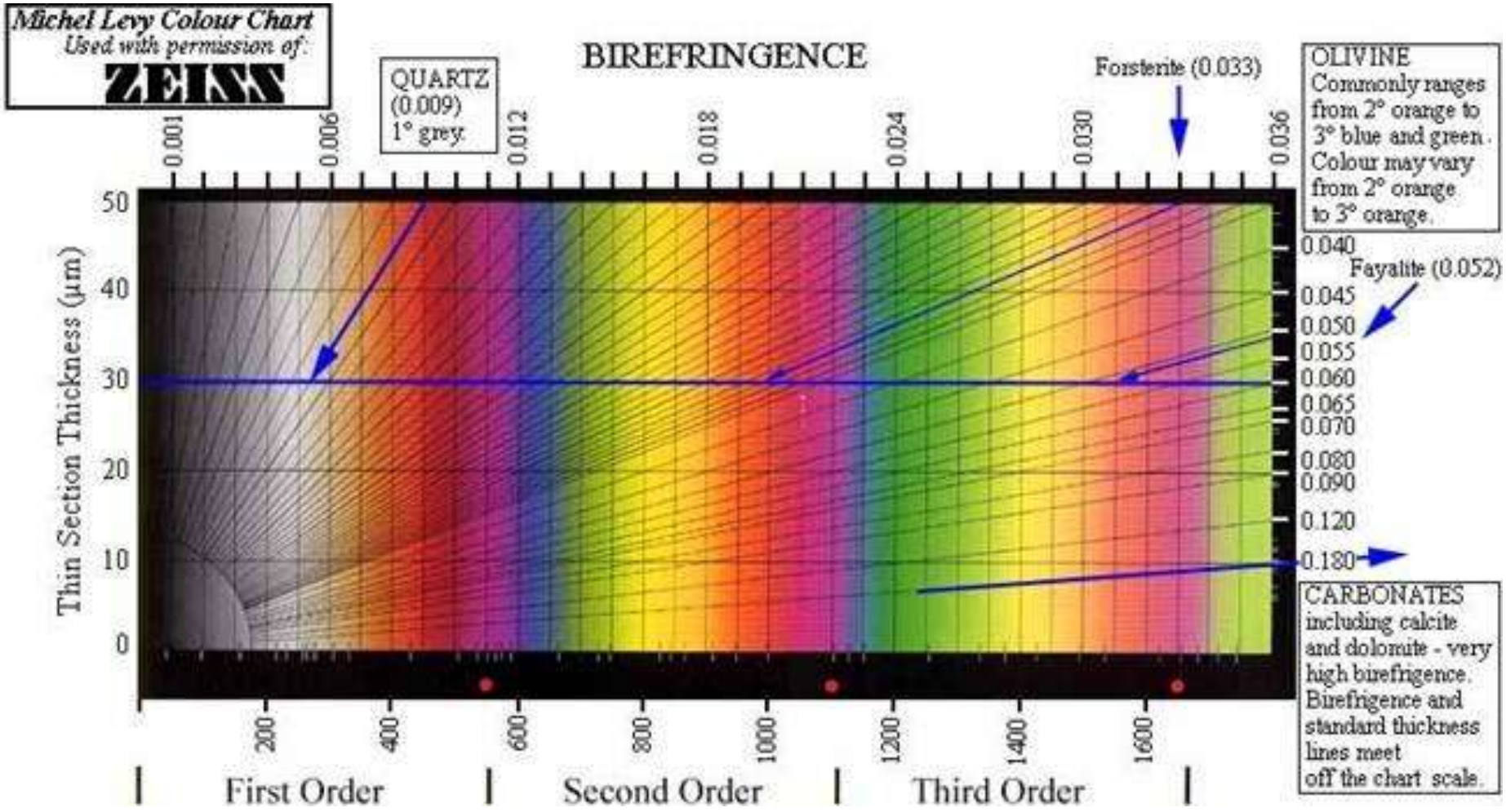

a)
z
Bn1
Bn2
2β
θ1
θ2
ρ
x
b)
c)
Bn
Bn
d)

Methodology of measurement




Bn
S


P
n_e
n_o
n_e
n_o
A


Michel Levy Colour Chart
Used with permission of:
ZEISS
BIREFRINGENCE
QUARTZ
(0.009)
1° grey
Forsterite (0.033)
OLIVINE
Commonly ranges from 2° orange to 3° blue and green. Colour may vary from 2° orange to 3° orange.
0.001
0.006
0.012
0.018
0.024
0.030
0.036
0.040
Fayalite (0.052)
0.045
0.050
0.055
0.060
0.065
0.070
0.080
0.090
0.120
0.180
Thin Section Thickness (µm)
50
40
30
20
10
0
CARBONATES
including calcite and dolomite - very high birefrigence. Birefrigence and standard thickness lines meet off the chart scale.
200
400
600
800
1000
1200
1400
1600
First Order
Second Order
Third Order