

RELATION BETWEEN ELECTROMAGNETIC  
THEORY AND THE JONES MATRIX  
TECHNIQUE IN THE CRYSTAL OPTICS  
OF SPATIALLY MODULATED MEDIA

*O. S. Kushnir, L. O. Lokot, L. P. Lutsiv-Shumski,  
I. I. Polovinko, Ya. I. Shopa*

Ivan Franko Lviv National University  
(8, Kyryl and Mefodii Str., Lviv 79005, Ukraine)

S u m m a r y

A relationship between the wave equation of electromagnetic theory and the differential equation which defines a spatial evolution of light polarization in the frame of the Jones matrix technique is analyzed in the case of transparent macroscopically inhomogeneous anisotropic optical media. A linear relation between the differential propagation matrix and transverse dielectric permittivity tensor is found. It is shown that the Jones calculus cannot be applied to calculating the optical parameters of incommensurately modulated crystals whose dielectric properties are weakly inhomogeneous but vary in space at a very high rate. Specific features of the normal wave polarization and the superposition principle in the crystal optics of incommensurately modulated media are revealed.