

LIGHT MODULATOR
ON THE BASIS OF MAGNETO-OPTICAL
CRYSTAL IN A BIMORPHIC STRUCTURE
OPERATING IN THE MAGNETO-MECHANICAL
VIBRATION MODE

I. V. Linchevskiy, O. N. Petrishev

National Technical University of Ukraine
“Kyiv Polytechnical Institute”
(37, Peremogy Ave., Kyiv 03056, Ukraine;
e-mail: igorvl2009@gmail.com)

S u m m a r y

A model of light modulator based on a bimorphic element consisting of a magneto-optical crystal layer on a magnetically passive substrate has been proposed. An equation describing magneto-mechanical vibrations in a rectangular bimorphic element with asymmetric thickness is derived, and an algorithm of its solution in the case of a specimen with free edges is proposed. The modulator is shown to be characterized by a two-dimensional distribution function for the rotation angle of the polarization plane in a light-beam cross-section. Calculations for bismuth-substituted yttrium ferrite garnet on a gadolinium-gallium substrate showed that the rotation angle of the light-beam polarization plane owing to the Faraday effect can reach 3° for the fundamental mode of bimorphic element vibrations.