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Polarizing and phase-shifting properties of multilayered X-ray mirrors with fluctuating parameters ARKADY SATANIN, Institute for Physics of Microstructures RAS, MARIA BARYSHEVA, NIKOLAY CHKHALO — It is well known that the multilayered periodical structures (MS) may be used for different X-ray optics applications: dispersion elements, mirrors, polarimeters etc. At the present the polarizing and phase-shifting properties of the MS attract much attention. It was found an intriguing behavior of the MS when the structures having almost the same reflection coefficients demonstrate the strong variations of the polarizing and phase-shifting characteristics. To understand this phenomenon we have investigated the distribution functions of polarization and phase-shift fluctuations for an array of identical MS depending on layer thickness fluctuations. It was shown both analytically and numerically that the relative small fluctuations of layer thickness and the deterministic (systematic) local period deviations may change dramatically the polarization and phase-shift of the MS. In our work we have shown that the polarization and phase-shift of the MS may be found from the reflection measurements.

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