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Abstract:We exploit the localized surface-plasmon resonance (LSPR) of terahertz gold gammadion structures for wafer scale critical dimension metrology of nanostructures. The proposed characterization method, LSPR spectroscopy, is based on optical transmission measurements and is benchmarked against numerical simulations of imprinted structures characterized by atomic force microscopy. There is a fair agreement between the two methods and the simulations enable the translation of optical spectra to critical dimensions of the physical structures, a concept known from scatterometry. The results demonstrate the potential of LSPR spectroscopy as an alternative characterization method to scanning electron microscopy, atomic force microscopy and scatterometry. © 2012 IOP Publishing Ltd.
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