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Title:THz frequency selective surface filters for earth observation remote sensing instruments
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Abstract:The purpose of this paper is to review recent developments in the design and fabrication of Frequency Selective Surfaces (FSS) which operate above 300 GHz. These structures act as free space electromagnetic filters and as such provide passive remote sensing instruments with multispectral capability by separating the scene radiation into separate frequency channels. Significant advances in computational electromagnetics, precision micromachining technology and metrology have been employed to create state of the art FSS which enable high sensitivity receivers to detect weak molecular emissions at THz wavelengths. This new class of quasi-optical filter exhibits an insertion loss < 0.3 dB at 700 GHz and can be designed to operate independently of the polarization of the incident signals at oblique incidence. The paper concludes with a brief overview of two major technical advances which will greatly extend the potential applications of THz FSS.
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