420. Title:ASK modulator based on switchable FSS for THz applications
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Abstract:An amplitude shift keying modulator that is based on a switchable frequency selective surface (FSS) is described for THz communication. The FSS uses a square loop aperture geometry, with each unit cell having four PIN diodes across the aperture at 90 degree intervals. To minimize the effect of bias lines on the overall frequency response of the FSS, a crossed-shape negative dc bias line, which is connected to the center of the FSS unit cell, has been placed on the rear surface of the dielectric substrate. Positive dc biasing is provided from the front side of the FSS structure. Simulation results are presented for two possible operating frequencies and two principal polarizations at normal and oblique incidence. These show that a free space modulator based on the proposed FSS structure would provide about 19 dB transmission loss at 600 GHz between on and off states of the PIN diodes for both transverse electric and transverse magnetic polarizations.