Abstracts

An optically controlled MMW beam-steering antenna based on a novel architecture

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Beam-steering millimeter-wave (MMW) antennas using photo-induced plasma gratings (PIPGs) offer a dramatic decrease in fabrication cost compared to their phased-array counterparts. We describe a totally new antenna design which has been tested in both the receiving and the transmitting modes. The new antenna is a compact device with a reconfigurable PIPG in a semiconductor plate as an output aperture. This aperture is fed by a tunnel-coupling dielectric waveguide. We demonstrated the antenna's scanning capability over a/spl plusmn/15/spl deg/ range. The new design permits the antenna to operate at various polarizations including linear polarization (either vertical or horizontal) and circular polarization (an ellipticity of only 0.8 dB has been demonstrated).

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