Abstracts

Two-dimensional optical signal-processing beamformer using multilayer polymeric optical waveguide arrays

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Optically controlled beamforming techniques are very effective for phased-array antenna control. We have developed a two-dimensional (2-D) Fourier transform optical signal-processing (OSP) beamformer. In the OSP beamformer, we use multilayer polymeric optical waveguide arrays to generate and control a 2-D specific phase-front and sample 2-D distributed light beams. These multilayer optical waveguide arrays consist of three layers and 13 waveguides; each layer has four, five, and four waveguides, respectively. We experimentally demonstrate 2-D beam steering in the X-band, and show the feasibility of the 2-D OSP beamformer.

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