Abstracts

Two-dimensional scanning leaky-wave antenna by utilizing the phased array

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An aperture-fed patch antenna array is connected to the open end of a short leaky-wave antenna (LWA) to demonstrate the two-dimensional beam-scanning capability in this paper. This design not only offers another radiation path of the reflected wave, but also creates another scanning radiation pattern on the back plane of the substrate. The reflected wave of the LWA is equally separated by a power divider, modulated by each varactor-tuned phase shifter, and injected into two radiating aperture-coupled antennas. The operated frequencies are tuned to control the LWA main position in the elevation plane; meanwhile, by tuning the phase difference between two phase shifters, the main beam of the aperture-coupled antenna array can be scanned in the backside E plane. Experimental result shows that the suppression of the reflected wave can be 7 dB at 10.0 GHz with a short LWA length of 6 cm (two wavelengths). The H-plane and backside E-plane scanning radiation patterns have great potential in many applications and provide more flexibility to traditional designs.

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