Abstracts

Investigation of Planar Antennas for Submillimeter Receivers

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A frequency-scaled model of a tapered slot antenna has been investigated. The antenna consists of a dielectric substrate which serves as a carrier for a tapered slotline. The width and the shape of the slotline and the dimensions of the substrate (including the value of the permittivity) have been varied to investigate the radiation patterns. The result is a planar antenna with a symmetrical beam in the E and H planes and a beam efficiency of almost 50 percent. The substrate thickness is the most important limiting factor for scaling the model to submillimeter frequencies. Taking away parts of the dielectric substrate in the front area of the antenna allows a relatively large substrate thickness. The variations of the half-power beam width versus slot parameters, versus the dielectric thickness of the substrate, and versus the length and the width of the substrate are presented. In addition the beam efficiency has been measured for various frequencies, and the radiation pattern has been calculated for comparison.

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