Abstracts

Focal Plane Imaging Systems for Millimeter Wavelengths

P.F. Goldsmith, C.-T. Hsieh, G.R. Huguenin, J. Kapitzky and E.L. Moore. "Focal Plane Imaging Systems for Millimeter Wavelengths." 1993 Transactions on Microwave Theory and Techniques 41.9 (Oct. 1993 [T-MTT] (Special Issue on Quasi-Optical Techniques)): 1664-1675.

We discuss critical aspects of imaging system design and describe several different imaging systems employing focal plane array receivers operating in the 3mm-2mm wavelength range. Recent progress in millimeter-wavelength optics, antennas, receivers and other components permits greatly enhanced system performance in a wide range of applications. We discuss a radiometric camera for all-weather autonomous aircraft landing capability and a high sensitivity cryogenically cooled array for use in radio astronomical spectroscopy. A near-focus system for identification of plastic materials concealed underneath clothing employs a two element lens, and has been demonstrated in active (transmitting) and passive (radiometric) modes. A dual mode imaging system for plasma diagnostics utilizes both active and passive modes at its /spl sime/140 GHz operating frequency to study small-scale structure. The radiometric imaging systems employ between 15 and 256 Schottky barrier diode mixers while the imaging receivers for the active systems include 64 element video detector arrays.

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