Abstracts

Low Noise Traveling-Wave Maser Receiver for Three Millimeter Wavelength

A.G. Cardiasmenos, J.F. Shanley and K.S. Yngvesson. "Low Noise Traveling-Wave Maser Receiver for Three Millimeter Wavelength." 1976 MTT-S International Microwave Symposium Digest of Technical Papers 76.1 (1976 [MWSYM]): 241-243.

A traveling-wave maser amplifier, using iron-doped rutile as the active material, has been developed in the frequency range 85 - 95 GHz. The device has demonstrated stable traveling-wave maser gain over an instantaneous bandwidth of 140 MHz and is capable of operation as a low noise receiving system for radio astronomy and communication applications in the millimeter wavelength region of the spectrum. The maser device uses a newly developed hybrid transmission mode allowing for easy coupling of the maser material to the microwave circuit. The mode, termed the slot-fed image guide mode provides high slowing and filling factor and is relatively easy to match over a wide bandwidth. Increased system sensitivity of an order-of-magnitude can be expected using this device as an alternative to state-of-the-art cooled Schottky-barrier mixer receivers.

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