Abstracts

A Traveling-Wave Maser Amplifier for 85-90 GHz Using a Slot-Fed Image-Guide Slow-Wave Circuit

A.G. Cardiasmenos, J.F. Shanley and K.S. Yngvesson. "A Traveling-Wave Maser Amplifier for 85-90 GHz Using a Slot-Fed Image-Guide Slow-Wave Circuit." 1976 Transactions on Microwave Theory and Techniques 24.11 (Nov. 1976 [T-MTT] (Special Issue on Millimeter Waves: Circuits, Components, and Systems)): 725-730.

A description is given of a newly developed traveling-wave maser amplifier for use at the new 13.7-m millimeter-wave radio teleseope of the Five College Radio Astronomy Observatory (FCRAO) near Amherst, MA. The maser amplifier, using iron-doped rutile as the active maser material, has achieved 15-dB electronic gain in the prototype over an instantaneous bandwidth of 140 MHz in the frequency range from 85 to 90 GHz. The use of a slot-fed image-guide mode which provides a wide-bandwidth coupling to the maser material is described and analyzed. Reduction of the total system noise temperature to less than 100 K including the atmosphere can be realized with these maser devices providing an order of magnitude improvement in system sensitivity.

❑ Return to main document.