Abstracts

Optical Generation, Distribution, and Control of Microwaves Using Laser Heterodyne (Short Papers)

G.J. Simonis and K.G. Purchase. "Optical Generation, Distribution, and Control of Microwaves Using Laser Heterodyne (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 667-669.

Results are presented which demonstrate the optical generation and transmission of a microwave signal by mixing two high-quality optical signals from diode-laser-pumped Nd:YAG ring lasers, resulting in a narrow microwave line width (less than 5 kHz line width at 3 dB and less than -115 dBc/Hz at 300 kHz from line center) and broad microwave tunability (dc to 52 GHz). A III-V semiconductor waveguide with a doping superlattice active region is used to optoelectronically provide 20 dB of amplitude control and up to 5pi of phase shift. This approach can be straightforwardly implemented using integrated optics and fiber-optic links for control of phased array antenna elements.

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