Abstracts

Fiber Optic Links for Millimeter Wave Communication Satellites

A.S. Daryoush, A.P.S. Khanna, K. Bhasin and R. Kunath. "Fiber Optic Links for Millimeter Wave Communication Satellites." 1988 MTT-S International Microwave Symposium Digest 88.2 (1988 Vol. II [MWSYM]): 933-936.

Large aperture phased array antennas operating at millimeter wave frequencies are designed for space-based communications and imaging. Array elements are comprised of active transmit/receive (T/R) modules which are linked to the central processing unit through a high-speed fiberoptic network. This paper demonstrates optical control of active modules for satellite communication at 24GHz. An approach called T/R level data mixing, which utilizes fiberoptic transmission of data signal individual T/R modules to be unconverted by an optically synchronized local oscillator, is demonstrated at 24GHz. In study free-running HEMT oscillator, used as local oscillator 24GHz, is synchronized using indirect subharmonic optical injection locking over a locking range of 14MHz. Results of link performance over 500-1000MHz is also reported in terms of gain-bandwidth, linearity and third order intercept, sensitivity, and dynamic range.

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