Abstracts

Wide-band millimeter-wave/optical-network applications in Japan

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This paper describes work on wide-band millimeter-wave (MMW)/optical-network applications in Japan-in particular, projects being pursued at the Advanced Telecommunications Research Institute (ATR). Digital-signal transmission at 118 Mb/s was tested. Results of the experiments demonstrate that highspeed digital-signal transmission, with a total carrier-to-noise ratio (C/N) degradation of less than 1.2 dB from a modem at a BER of 10/sup -6/, is feasible. Similarly, analog FM-signal transmission with a weighted S/N of more than 45 dB is also feasible at a signal bandwidth of 18 MHz and FM carrier frequency of 43.75 GHz. Based on these results, a demonstration system was constructed, and the feasibility of the system was confirmed. Several key technologies for system construction such as an MMW optical modulator and an MMW high-speed p-i-n detector and some related technologies are also described, In addition, an advanced system considered suitable for future high-speed mobile communications is proposed. This system employs an optical signal-processing multibeam antenna, where the direction of each sharp beam can be adaptively controlled.

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