

Call for Papers

IEEE JOURNAL ON SELECTED AREAS IN COMMUNICATIONS

Applications for RF and Microwave Subcarriers to Optical Fiber Transmission in Present and Future Broadband Networks

Jointly Prepared with the IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES

THERE has recently been a renewed interest in the use of RF and microwave subcarriers for transmission over optical fibers. This has occurred as a result of increased interest in finding near-term, low-cost solutions for the transport and distribution of multichannel TV services to the subscribers, and as a result of the availability of electrooptic components with multigigahertz bandwidth.

Transmission of modulated subcarriers over optical fiber is an attractive approach to broadband systems because the required electronics is well-developed and the required optoelectronics components are now commercially available. Because of the compatibility of modulation formats, analog frequency modulation is particularly well-suited for TV distribution networks, which could overbuild or replace existing coaxial cable television systems. Furthermore, since subcarriers are independent of each other, it is possible to transmit over the same fiber both analog and digital services such as POTS, narrowband ISDN, and digital video signals. The multigigahertz bandwidth of subcarrier multiplexed systems will make possible the addition of high definition television services without major difficulties. All these advantages open up many potential new applications of subcarrier multiplexing techniques for both present and future broadband networks.

Because of the widespread interest and the timeliness of this topic, we think it is appropriate to assign one issue of IEEE JOURNAL ON SELECTED AREAS IN COMMUNICATIONS for researchers in analog optical fiber technology to communicate their latest results and discuss outstanding technology issues. The proposed issue will also serve as a forum for system engineers to explore novel architectures and network applications.

1) Novel Architectures Employing RF and Microwave Subcarriers

- Application of subcarrier multiplexed optical systems in the transport and distribution of multichannel video, switched video, and high-definition television services.
- Application of subcarrier multiplexing in present and future broadband networks. The role of subcarrier multiplexing technology in digital networks.
- The impact of subcarrier multiplexing techniques on network evolution.

2) Electrooptic Components for RF and Microwave Transmission

- Theory and design of light sources with high linearity, and low intensity noise.
- Low-cost, high-return-loss transmitter packages, or high bandwidth transmitter and receiver packages for subcarrier multiplexed systems.
- Theory and design of broadband and narrowband low-noise optical receivers for subcarrier multiplexed optical systems.
- High-speed, low-cost electronic circuits for subcarrier multiplexed fiber systems.

3) Subcarrier Multiplexed Optical Fiber System Technology

- Design considerations for subcarrier multiplexed fiber systems.
- Novel subcarrier multiplexed fiber systems experiments.
- Sources of degradation in subcarrier multiplexed systems—laser nonlinearity, intensity noise, reflections, and other system degradation.
- Comparison between subcarrier multiplexed and baseband digital fiber optic systems.

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