

OPTICAL FIBER COMMUNICATION AND INTEGRATED OPTICS

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ABSTRACT

In about ten years, efficient research and diligent technology have carried the field of optical communication to such a level that many systems operating with a wide range of requirements have been developed throughout the world. Thus, cables containing up to more than one hundred easy-to-splice multimode fibers can transmit thousands of telephone channels; injection lasers and light emitting diodes made of GaAlAs operating at about $0.85\mu\text{m}$ can be directly modulated at rates as high as hundreds of MHz; silicon PIN and the more sophisticated avalanche gain detectors, both with superb characteristics, are widely used.

Technology moves now toward the consolidation of more efficient systems for an ever increasing number of applications. Research, on the other hand, aims toward the implementation of sources and detectors operating in the 1 to $1.6\mu\text{m}$ wavelength region where multimode and single mode fibers with low loss and low material dispersion have already been demonstrated.

Simultaneously, the advent of single mode fibers capable of transmitting extremely large amounts of information will stimulate the development of integrated optical devices such as sources, detectors, modulators, frequency multiplexers and demultiplexers, switches, bi-stable devices, etc. for many of which feasibility demonstrations already exist.