СЕКЦІЯ 28. МІЖНАРОДНА ТЕХНІЧНА ОСВІТА: ТЕНДЕНЦІЇ ТА РОЗВИТОК

PHOTONIC CRYSTAL FIBERS IN TELECOMMUNICATIONS TECHNIQUES

Haider Ali Muse (Irak)
Kharkiv National University of Radio Electronics, Kharkiv

Photonic crystal fibers provide better than any other transmission bandwidth and are now the transmission medium of choice for long distance in telecommunication systems. The development of all optical communications could benefit from the index guiding photonic crystal fibers, conventional optical fibers have within the last decades revolutionized the communications industry and it is today a mature technology being pushed to its limit with respect to properties such as losses, single mode operation and dispersion. In this paper we will discuss the benefit of using photonic crystal fibers in telecommunications techniques. Their use for communication purposes was considered impractical because of high losses (1000 dB/km).The loss of optical fibers was reduced to below 20 dB/km. For photonic crystal fibers to realize their potential and advantages over conventional fibers in fiber optic communication. In communication the fibers could provide many new solutions.

The photonic crystal fibers offer the possibility of low losses and dispersion, a possible competitor to conventional fibers. Photonic crystal fibers offer new solutions for laser physics, nonlinear optics, and optical technologies, as they combine dispersion tuneability and a high degree of light-field confinement in the fibre core.

The maximum laser fluence in an optical system is limited by the laser damage of material of optical components. The availability of low-loss fibers led to a revolution in the field of light wave technology and started the era of fiber-optic communications. Photonic crystal was created and led to many subsequent developments in their fabrication, theory, and application. photonic crystal fibers compressors in fibre-laser systems allow the generation of output light pulses with a pulse width on the order of 100 fs in the megawatt range of peak powers.