

EVALUATION OF EFFECTIVE AREA ERBIUM DOPED FIBERS

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The propagation of an optical signal through a fiber in high speed fiber optic transmission systems (FOTS) can give rise to nonlinear optical effects (NOE) since these arise even at minor concentrations of light power in the fiber. An optical fiber is characterized by nonlinear quantities, the most significant of which are its effective cross-section area A_{eff} and nonlinear length L_{NL} [1, 2]. In the last years a tendency has been observed to turn to completely optical methods of signal processing, which allow for creation of basically new information networks with distributed information treatment [3]. With the development of erbium doped fiber amplifiers (EDFA), it is important to evaluate the A_{eff} erbium optical fibers. In this paper we describe the evaluation of A_{eff} with several research methods and provide results comparison. Measurement results showed that fiber A_{eff} value is considerably changing for two orthogonal offset directions (Fig. 1). To minimize this effect in A_{eff} measurements we suggest using polarization scrambling device after laser source.

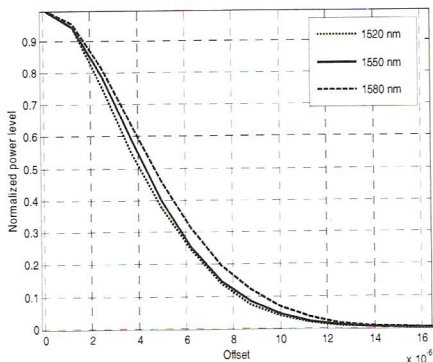


Fig. 1. Measured fiber cross section of erbium doped for three different wavelengths: 1520, 1550 and 1580 nm.

Keywords: optical fibres, nonlinear optical effects, telecommunications.

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