Potentials of Perfluorinated Polymer Optical Fibre operating at 850 nm for local area networks

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Abstract:

Silica based single mode optical fibre (SMF) is widely used in WAN (Wide-Area Network) and in MAN (Metropolitan Area Network). In the access networks, single mode and multimode glass fibres constitute the only truly practical physical layer for optical networking. In small scale networks (LAN's, building-wiring, consumer applications,…) they never reached the same success due to their high cost and the skilled labor required to install silica fibre.

Polymer optical fibres (POF), once laboratory curriosities with very low performances and limited operating range, have now moved to the frontstage of industrial development. The possibility to achieve nowadays high bandwidth-length products is possible thanks to the advent of perfluorinated GIPOF (Graded Index POF).

This paper aims at putting forward the high potentials of PF GIPOF in LAN applications. The first part presents the effects of launch conditions on the modal bandwidth of a silica fibre OM1 or A1b[1] and of a fluorinated polymer fibre[2] of category A4g[3]. In the second part, the differences in terms of dispersion penalty and bit error rate (BER) of a Gigabit Ethernet link will be presented for both fibres as well. In the third part, the silica and polymer fibres are compared when they are used to enhance the indoor coverage of a wireless LAN. Error Vector Magnitude results demonstrate the potentials of GIPOF in radio over fibre systems for mobile and WLAN applications operating at 850 nm.