

# **Abstract**

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## **A comparative study of the performance of graded index perfluorinated plastic and alumino silicate optical fibers in internal optical interconnections**

This paper theoretically investigates a comparative analysis of the performance of both graded index perfluorinated plastic optical fiber and alumino-silicate optical fiber in internal optical interconnections operation, where these materials have low dispersion at the operating wavelength 1.3  $\mu$ m. Temperature dependence of total dispersion coefficient is deeply investigated for these fibers. The temperature variations range from  $-50$   $^{\circ}$ C to  $100$   $^{\circ}$ C. The obtained results show the dramatic effects of increasing ambient temperature variations on the signal quality degradation. The effects of increasing optical fiber length on optical interconnections performance efficiency and operation speed. A comparative study shows that, perfluorinated plastic optical fiber overcomes the alumino- silicate in operation performance efficiency and installation flexibility.