

LIANG CHEN, Department of Physics, University of Ottawa, Ottawa, Ontario K1N 6N5

*Polarization mode dispersion and polarization dependent loss in single mode fiber communication systems*

Single mode fibers in fiber optic communication networks in fact supports two degenerate polarization modes. This degeneracy, however, could be lifted by either environmental perturbations or by manufacturing imperfections during fabrication. As a result, light group velocity can become polarization dependent, this is the so-called polarization mode dispersion (PMD). Furthermore the light intensity attenuation can also become polarization dependent, this is the so-called polarization dependent loss (PDL). PMD will broaden an optical pulsewidth, while PDL will result in optical power fluctuation. PMD and PDL will thus induce extra bit-error for a high rate digital optic communications fiber network. Because fibers installed in the field are subjected to dynamic environments such as wind and temperature, the PMD and PDL interactions are therefore intrinsically statistical. We will review the challenges of calculating precisely what the impact of combined PMD and PDL on high speed communication systems.