

Partial Differential Phase Shift Keying - Theory and Motivation

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Recently, many evidences demonstrate that partial Differential Phase Shift Keying (i.e., when the delay inside the Delay Interferometer is shorter than the symbol period) can partially compensate the signal deformation caused by spectrally narrowing the optical channel (by interleavers, add-drop elements, WDM filters, etc.). In this paper the source of this effect is investigated with numerical simulations and, to the best of our knowledge for the first time, analytically. We found that our analytical analysis matched the simulation results with high accuracy. Furthermore, a phenomenological relation, which relates the optimum Free Spectral Range to the channel bandwidth, was derived.

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