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Interference Focusing for Simplified Optical Fiber Models with Dispersion

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A discrete-time two-user interference channel model is developed that captures non-linear phenomena that arise in optical fiber communication employing wavelength-division multiplexing (WDM). The effect of non-linearity is that an amplitude variation on one carrier induces a phase variation on the other carrier. Moreover, the model captures the effect of group velocity mismatch that introduces memory in the channel. It is shown that both users can achieve the maximum pre-log factor of 1 simultaneously by using an interference focusing technique introduced in an earlier work.

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