Project: Amplifiers and Transients

GOALS

1. To develop an amplifier model that can take into account gain saturation, transience, and differential gain in a wavelength division multiplexed (WDM) system.

2. To use this model study the evolution of the gain and the optical signal to noise ratio in a quasi-periodic dispersion-managed soliton system and a WDM non-return to zero or chirped return to zero system.

REFERENCES

Single-channel model, including transience

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WDM Model

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I. Roudas, N. Antoniades, D. H. Richards, R. E. Wagner, J. L. Jackel, S. F. Habiby, T. E. Stern, and A. F. Elrefaie, "Wavelengh-domain simulation of multiwavelength optical networks," *J. Select. Topics Quantum Electron.*, vol. 6, pp. 348–362, Mar./Apr. 2000.

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PROCEDURE

1. Create simple model for OSNR based on a given n_{sp}.

2. Create a two-level, length-dependent, single-channel model that takes into account gain saturation and then transience. Apply it to soliton propagation

3. Create a length-dependent WDM model that takes into account frequency-dependent gain variation as well as gain saturation.

4. Add transience to the model and apply it to channel adding and dropping.