1032-00-112   **Yeojin Chung*** (`ychung@smu.edu`), Department of Mathematics, Southern Methodist University, Dallas, TX 75275, and **Avner Peleg**, Arizona Center for Mathematical Sciences, University of Arizona, Tucson, AZ 85721. *Pulse propagation in massive multichannel optical fiber communication networks with a mean-field model.*

We present the combined effect of delayed Raman response and bit pattern randomness on pulse propagation in massive multichannel optical fiber communication systems. The mean-field description of the propagation is given by a perturbed nonlinear Schrödinger equation, which takes into account changes in pulse amplitude and frequency as well as emission of continuous radiation. We perform extensive numerical simulations with the model, and analyze the dynamics of the frequency moments, the bit-error-rate and the mutual distribution of ampllitude and position. The results of our numerical simulations are in good agreement with theoretical predictions based on the adiabatic perturbation approach. (Received August 17, 2007)