1116-35-499 **Avner Peleg*** (avpeleg@gmail.com), Racah Institute of Physics, The Hebrew University of Jerusalem, 91904 Jerusalem, Israel, and **Quan M Nguyen** and **Toan T Huynh**. *On the relation between collision dynamics of soliton sequences of coupled-NLS equations and population dynamics in Lotka-Volterra models.*

We use model reduction along with collision-rate calculations to show that collision dynamics of N sequences of solitons of perturbed systems of coupled nonlinear Schrödinger (NLS) equations can be described by N-dimensional Lotka-Volterra (LV) models, where the form of the LV model depends on the nature of the perturbation term. We employ stability and bifurcation analysis of the equilibrium points of the LV models to stabilize soliton-sequence propagation and to achieve on-off and off-on transmission switching. We demonstrate the relation in the case where the perturbations are due to a Ginzburg-Landau gain-loss profile and Raman scattering. In this case, numerical simulations with a system of N coupled nonlinear Schrödinger equations with $2 \leq N \leq 4$ show excellent agreement with the predator-prey model's predictions. Moreover, stable on-off and off-on switching of multiple soliton sequences and stable multiple transmission switching events are demonstrated by the simulations. We discuss the reasons for the robustness and scalability of transmission stabilization and switching in this case. (Received September 04, 2015)