1135-35-418 **Avner Peleg*** (avpeleg@gmail.com), **Quan M Nguyen**, **Debananda Chakraborty** and **Toan T Huynh**. *Using analysis of fast collisions between solitons of the nonlinear Schrödinger (NLS) equation for mathematical modeling of pulse propagation in broadband optical waveguide systems.*

I will present a method for calculating the effects of weak perturbations on a single fast collision between two fundamental solitons of the NLS equation. The method is based on obtaining an equation for the collision-induced change in the envelopes of the colliding solitons and then projecting both sides of the equation on the eigenfunctions of the linear operator describing weak perturbations about the NLS soliton. I will illustrate how the method is used for calculating the collision-induced changes in the soliton parameters and shape. Furthermore, I will show how the results of the single-collision analysis can be used in constructing deterministic and stochastic mathematical models for pulse propagation in broadband optical waveguide systems. (Received September 01, 2017)