1126-34-296 **Brenton J LeMesurier*** (lemesurierb@cofc.edu), Departmentof Mathematics, College of Charleston, Charleston, SC 29403. *PDE Models for Pulses in Binary Wave Guide Arrays.*

Binary waveguide arrays are linear arrays of optical waveguides with binary alternation of parameters, and have been of recent interest. They can be modeled by systems of nonlinear ODE's with forms related to the discrete nonlinear Schrödinger equation. Such equations can also arise in semi-classical molecular models of polymers with excitable states in each monomer, and coupling between these.

An important class of solutions arises from an initially highly localized signal, such as a single element of the array. Simulations show that for a wide array of parameter values and of such initial data, a pulse is generated that travels approximately as a traveling wave. After a suitable phase shift in the variables, this pulse quickly develops a slow spatial variation, leading to a long-wave approximation by a system of coupled third order PDE's; one each for nodes of even and odd indices.

This system of PDE's is presented, and verified to quite accurately reproduce the pulse propagation seen in the ODE system; further there is a strong tendency for the behavior of the two PDE components to converge, with a corresponding convergence of the even and odd index parts of the ODE system solution. The PDE model gives some indication of why this occurs. (Received January 16, 2017)