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TITLE: FINITE TIME SINGULARITY FORMATION IN
A NONLINEAR SCHRÖDINGER TYPE SYSTEM

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Abstract:

In this talk I will describe the recent progress on finite time singularity formation in a system of three coupled nonlinear wave equations. This system arises as a model for the two-dimensional wave propagation in a generalized elastic medium. It can be written as a nonlinear Schrodinger equation with non-local terms. The cubic nonlinear Schrodinger equation and the Davey-Stewartson system are two well-known special cases of the system.

In particular, I will report that under certain conditions on the physical parameters, certain solutions of the system develop singularity. Simulation results based on two different numerical algorithms will also be presented for the solutions that blow up at the origin as the temporal variable tends to a finite value. Numerical results are in complete agreement with the analytical results and they allow us to determine the singularity time numerically.

*This talk is based on the results obtained in a recent Ph.D. study by Gülçin M. Muslu at Istanbul Technical University.