1104-14-50 **Noah S. Daleo*** (nsdaleo@ncsu.edu), **Jonathan D. Hauenstein** and **Dhagash Mehta**.

Algebraic geometrization of the Kuramoto model: equilibria and stability analysis.

The Kuramoto model is a fascinating tool for describing the behavior and synchronization of a set of coupled phase oscillators. It has a wide variety of applications in physics, chemistry, biology, and electrical engineering. The equilibrium conditions of the Kuramoto model depend sinusoidally on the phase difference between pairs of oscillators, and this nonlinearity poses a significant computational challenge when one wishes to find equilibria. To deal with this challenge, we translate it into an algebraic geometry problem, which we are able to solve using numerical algebraic geometric techniques. In doing so, we unify the problem of finding equilibria at various values of coupling constants, natural frequencies, and on different graphs. (Received August 12, 2014)