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**Tianran Chen** and **Robert Davis\*** (rdavis@hmc.edu), 320 E. Foothill Blvd., Claremont, CA 91711. *A Toric Deformation Method for Solving Kuramoto Equations.*

The Kuramoto model describes the behavior of interconnected oscillators in a network. Solutions to the system correspond to synchronization configurations of the network, and a difficult problem is to describe the number of synchronization configurations after taking a rotational frame of reference. In this talk, we will consider synchronization in networks whose underlying graphs are cycles. We will present a toric deformation homotopy method for locating all frequency synchronization configurations, which induces a deformation of the set of the synchronization configurations into a series of toric varieties. This is done by constructing the adjacency polytope of the graph and finding regular triangulations through purely discrete-geometric means. (Received January 28, 2019)