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Rachel N. Leander* (leander@math.utk.edu), Department of Mathematics, 1403 Circle Drive, Knoxville, TN 37996. *Optimal Control of Kuramoto Oscillators.*

We use optimal control theory to compare the coherence of two systems of finitely many nonlinear oscillators. Oscillator dynamics are governed by the Kuramoto model; a system of coupled, nonlinear, ordinary differential equations. The systems are identical except that the first system is governed by mean field coupling while the coupling coefficients of the second system evolve in time. We use optimal control theory to determine the 'cheapest' way that the system with variable coupling coefficients can obtain the same level of coherence as the system with mean field coupling. (Received August 20, 2008)