Dynamics of Circulant Systems

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In this talk we analyze the dynamics and geometry of a class of so-called circulant systems of ODE's. Such equations are invariant under the action of a cyclic group and are inspired by equations studied in the synthetic biology literature. Examples include the repressilator and the Sprott system. We analyze invariant sets, global bifurcation behavior, long time asymptotics and the existence of periodic orbits. We develop the theory and present simulations. This is joint work with Matthew Kvalheim for the University of Pennsylvania.