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Multistable phase patterns in finite oscillator networks DANIEL GOLDSTEIN, Brandeis Univ — Recent experiments on spatially extend arrays of droplets containing Belousov-Zhabotinsky reactants have shown a rich variety of spatio-temporal patterns. Motivated by this experimental set up, we study a simple model of chemical oscillators in the highly nonlinear excitable regime in order to gain insight into the mechanism giving rise to the observed multistable attractors. By allowing intrinsic fluctuations to influence a simple activator inhibitor model, switching between stable attractors is observed. When coupled, these two attractors have different preferred phase synchronizations, leading to complex behavior. We study rings of coupled oscillators and observe a rich array of oscillating patterns. We characterize the different modes of oscillation in the mean-field model and compare those to the oscillations observed in stochastic simulations.

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