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Adela Nicoleta Comanici* (adelanc@math.vt.edu), Blacksburg, VA 24061-0123, and **Martin Golubitsky** (mg@math.uh.edu), Houston, TX 77204-3008. *Pattern Formation on Growing Square Domains: A Case Study via Mode Interactions.*

Numerical simulations of reaction-diffusion systems with Neumann boundary conditions (NBC) on growing square domains by Maini et al. exhibit square and stripe (or roll) patterns that are usually associated with bifurcations from a trivial equilibrium on a square lattice. However, these patterns change as the domain grows.

In this talk we discuss several of these transitions; namely, transitions between different types of squares and between squares and stripes (or rolls). We show that these transitions can be understood by tracing paths through the unfoldings of certain codimension two mode interactions.

We have found that a generic continuous transition can occur between two types of squares. Also, the transition between squares and stripes can generically occur either via steady-states and time-periodic states (*standing waves*), or via a jump. (Received September 14, 2007)