1062-37-33   **Bernard P Brooks***, School of Mathematical Sciences, Rochester Institute of Technology, 85 Lomb Memorial Dr., Rochester, NY 14623. *Discrete Diffusion in Systems of 1st Order Difference Equations.*

When considering the discretization of a reaction diffusion equation one must decide how to represent the spatial domain and choose between two choices for discrete diffusion: diffuse and then react or react and then diffuse. These choices place restrictions on the diffusion coefficients and might determine the presence of Turing instabilities. It will be shown that the react then diffuse is the better choice to correspond with the continuous theory of Turing instabilities. Spatial domains with periodic boundary conditions of 1, 2 and 3 dimensions will be shown. (Received July 02, 2010)