Yida Ding* (yding54@wisc.edu), 4701 Sheboygan Ave apt 104, Madison, WI 53705, and Gheorghe Craciun. Minimal invariant regions and globally attracting regions for toric differential inclusions.

Some biochemical or biological interaction networks are "variable-k persistent", i.e., informally speaking, no species goes extinct even if the system is subjected to some time-dependent external forcing, or if the parameters in the system are time-dependent. For example, it has been conjectured that dynamical system models of weakly reversible networks (i.e., networks for which each reaction is part of a cycle) are variable-k persistent. Actually, even more is conjectured to be true for these systems: there exist globally attracting compact sets within the positive orthant, i.e., any solution of such a system converges to a compact set that ensured a uniform positive lower and upper bounds for large enough time. We describe explicit constructions of such compacts sets, obtained by embedding variable-k systems into toric differential inclusions. (Received July 11, 2019)