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Max Glick* (maxglick@umich.edu). *Dynamical systems that become singular in both directions.*

I will be discussing work in progress, inspired by a result of R. Schwartz about the pentagram map (a dynamical system defined for plane polygons). The result states that a polygon sent by the pentagram map to a single point must also be mapped by a certain iterate of the inverse pentagram map to a single line. The degeneracies of these end polygons make it impossible to carry the dynamics any farther in either direction.

It appears that a good number of discrete dynamical systems exhibit similar behavior. In each case, encountering an extreme singularity implies that iterating the inverse system will lead to another such singularity after a predictable number of steps. Some of the systems, including the pentagram map, can be described in terms of cluster algebras. In this language propagation corresponds to bipartite mutations in a certain Y-pattern, and the singularities occur when all the y-variables about to be mutated equal -1. (Received February 15, 2013)