1125-65-2491 **Sarah Ryan Black*** (sblack@icasa.nmt.edu) and **Emily Kim Miller** (emiller@icasa.nmt.edu). *Automated Computation for Symbolic and Graphical Representations of Separatrices for N-Dimensional Dynamical Systems.*

In dynamical systems, the separatrix is formally defined as the boundary of two or more regions exhibiting different behaviors. Finding an exact analytic expression for the separatrix of a system is occasionally very difficult and often impossible; numeric approximations are usually the only option to express these important boundaries. Separatrices allow us to gain insight into dynamical systems when other methods are insufficient or impractical. In the literature, there are several well-known approaches to finding numeric approximations of separatrices; these approaches focus on systems with basins of attraction and saddle nodes. In this paper, the authors propose an algorithm for finding separatrices that is not dependent on the dynamical system containing basins of attraction or saddle nodes. In fact, the algorithm will find a separatrix between any two regions that exhibit divergent behavior. Examples presented will focus on using the algorithm to construct numeric approximations of separatrices in 2-dimensional and 3-dimensional nonlinear autonomous dynamical systems. However, the algorithm itself is dimensionless and can be extended to higher dimensional systems. (Received September 20, 2016)