1116-57-1606 **Thomas Stephens*** (tstephe3@gmu.edu), 4400 University Drive, MS: 3F2, Exploratory Hall, room 4400, Fairfax, VA 22030. *Rigorous validation of isolating blocks for flows and their Conley indices.*

Isolating blocks are particular compact and connected subsets in the phase space of a dynamical system generated by an ordinary differential equation. Points in the boundary of an isolating block which are carried out of the block by the differential equation in forward time belong to the so-called exit set. Conley index theory recognizes that the isolated invariant set, defined as the maximal invariant subset of the flow contained within the interior of a block, is topologically related to the block and its exit set, and that this information is robust under perturbation. In this talk we present a new method for rigorously verifying isolating blocks and their exit sets. Our method makes use of a recently developed adaptive algorithm for rigorously determining the topology of nodal sets (sublevel and superlevel sets) of smooth functions, which combines an adaptive subdivision technique with interval arithmetic. This procedure has been used to rigorously compute the homological Conley index of several isolated invariant sets, and in turn has provided computer assisted proofs of the existence of heteroclinic orbits in several nontrivial examples. (Received September 20, 2015)