1087-37-215 **Eduardo G Altmann** and **Carl P Dettmann*** (carl.dettmann@bris.ac.uk), School of Mathematics, University Walk, Bristol, BS4 2LB, United Kingdom, and **Orestis Georgiou**, **Rainer Klages** and **Georgie Knight**. *Escape and diffusion through small holes.*

A dynamical system may be "opened" by allowing trajectories to leak out through one or more holes (subsets of phase space). Given a distribution of initial conditions, we study the probability of remaining within the system as a function of time and the size and position of the hole(s). A chain of systems linked by their holes can also model deterministic diffusion. Recent results for escape and diffusion in one-dimensional expanding maps will be discussed, including the first expansion for the escape rate beyond linear order in hole size, an exact additivity formula for diffusion coefficients and new relations between escape, diffusion and periodic orbits. Connections will be made with particles escaping from containers with small holes: Open billiards. (Received December 04, 2012)