1087-37-130 **Rafael de la Llave** and **Nikola P. Petrov*** (npetrov@ou.edu), Department of Mathematics, University of Oklahoma, 601 Elm Avenue, Norman, OK 73019, and **Arturo Olvera**. *Heteroclinic shadowing and applications to renormalization.*

We propose certain asymptotic relations among the scaling exponents of different transitions to chaos, called the *Principle of Approximate Combination of Scaling Exponents* (PACSE). According to PACSE, if the combinatorics of a transition is a composition of two simpler combinatorics, then the scaling exponent of this transition is approximately equal to the product of the scaling exponents of the two simpler transitions. We give numerical evidence for PACSE for unimodal maps, circle maps, dynamics on the boundaries of Siegel disks, and area-preserving twist maps.

We propose an explanation of PACSE in terms of the dynamical properties of the renormalization operators. More precisely, the numerically observed phenomena would occur if the stable and unstable manifolds of two hyperbolic fixed points of the renormalization operators (corresponding to different transitions to chaos) intersect transversely. As an essential ingredient in the theoretical justification of this proposal, we prove a general shadowing theorem that works for infinite dimensional discrete dynamical systems that are not necessarily invertible (which is the case of the renormalization operators acting in appropriate function spaces). (Received December 02, 2012)