1138-35-208 **Alim Sukhtayev*** (sukhtaa@miamioh.edu), 123 Bachelor Hall, 301 S. Patterson Ave., Oxford, OH 45056, and **Margaret Beck**, **Graham Cox**, **Chris Jones** and **Yuri Latushkin**. *A dynamical approach to semilinear elliptic equations.*

We describe a procedure for reducing a semilinear elliptic PDE to an (infinite-dimensional) dynamical system on the boundary of some fixed bounded domain $\Omega \subset \mathbb{R}^n$.

Suppose u satisfies the equation $\Delta u + F(x,u) = 0$ on $\mathbb{R}^n$. When the domain is deformed through a one-parameter family $\{\Omega_t\}$, it is shown that the Cauchy data of u on $\partial\Omega_t$ satisfies a Hamiltonian evolution equation. If Ω is deformed smoothly to a point, this equation admits an exponential dichotomy, with the unstable subspace at time t corresponding to the Cauchy data of weak solutions to the PDE on Ω_t. (Received February 09, 2018)