In the study of dynamical systems, the set of periodic points carry important information of the dynamics. In analogous to the Hasse-Weil zeta function in number theory, a zeta function was proposed by Artin and Mazur to count the set of isolated periodic points of the dynamics arising from diffeomorphisms of compact manifolds.

The Artin-Mazur zeta function is the function that we want consider for dynamics over $p$-adic fields. In this talk, we’ll give a definition for zeta function of dynamics over $p$-adic field. Some of its properties will be discussed and especially, we will be concerned with whether or not it is a rational function. Zeta functions for a family of polynomial maps over a $p$-adic field will be presented. (Received September 13, 2009)