

A Dichotomy in p-adic Dynamics: Measure-preservation of 1-Lipschitz functions vs Bernoullicity of expansive functions

Abstract

Dynamical systems on the ring \mathbb{Z}_p of p-adic integers are classified as a dichotomy between 1-Lipschitz functions and expansive functions. In this talk, we formulate a conjecture for a measure-preservation criterion of 1-Lipschitz functions on \mathbb{Z}_p , in terms of Mahler's expansion. Then we verify that it also holds for a wider class of 1-Lipschitz functions that are uniformly differentiable mod p, which is first introduced by Anashin. Also we formulate a conjecture for a Bernoullicity of expansive maps on \mathbb{Z}_p in Mahler's expansion and then verify that this conjecture holds for a wider class of expansive maps satisfying certain assumptions. The latter work is based on a Bernoullicity criterion of expansive maps on \mathbb{Z}_p in van der Put's expansion, which follows from extending the criterion of Khrennikov and Yurova.