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J. Kingsbery, A. Levin, A. Preygel and C. E. Silva* (csilva@williams.edu), Math
Department, Williams College, Williamstown, MA 01267. *On measure-preserving C^1
transformations of compact-open subsets of non-archimedean local fields.*

We introduce the notion of a locally scaling transformation defined on a compact-open subset of a non-archimedean local field. We show that this class encompasses the Haar measure-preserving transformations defined by C^1 (in particular, polynomial) maps, and prove a structure theorem for locally scaling transformations. We use the theory of polynomial approximation on compact-open subsets of non-archimedean local fields to demonstrate the existence of ergodic Markov, and mixing Markov transformations defined by such polynomial maps. We also give simple sufficient conditions on the Mahler expansion of a continuous map $\mathbb{Z}_p \rightarrow \mathbb{Z}_p$ for it to define a Bernoulli transformation. (Received August 16, 2005)