1139-20-352 **Elsayed Ahmed** (eahmed1@mail.usf.edu), Department of Mathematics and Statistics, University of South Florida, 4202 E Fowler ave, CMC 342, Tampa, FL 33620, and **Dmytro Savchuk*** (savchuk@usf.edu), Department of Mathematics and Statistics, University of South Florida, 4202 E Fowler ave, CMC 342, Tampa, FL 33620. *Endomorphisms of regular rooted trees induced by the action of polynomials on the ring $\mathbb{Z}_d$ of d-adic integers.*

We show that every polynomial in $\mathbb{Z}[x]$ defines an endomorphism of the d-ary rooted tree induced by its action on the ring $\mathbb{Z}_d$ of d-adic integers. The sections of this endomorphism also turn out to be induced by polynomials in $\mathbb{Z}[x]$ of the same degree. In the case of permutational polynomials acting on $\mathbb{Z}_d$ by bijections the induced endomorphisms are automorphisms of the tree. In the case of $\mathbb{Z}_2$ such polynomials were completely characterized by Rivest. As our main application we utilize the result of Rivest to derive the condition on the coefficients of a permutational polynomial $f(x) \in \mathbb{Z}[x]$ that is necessary and sufficient for f to induce a level transitive automorphism of the binary tree, which is equivalent to the ergodicity of the action of $f(x)$ on $\mathbb{Z}_2$ with respect to the normalized Haar measure. (Received February 16, 2018)