

1135-37-183

Andrew Bridy* (andrewbridy@tamu.edu) and **Thomas J. Tucker**
(thomas.tucker@rochester.edu). *Arboreal finite index for cubic polynomials.*

Let K be a global field of characteristic 0. Let $f \in K[x]$ and $b \in K$, and set $K_n = K(f^{-n}(b))$. The projective limit of the groups $\text{Gal}(K_n/K)$ embeds into the automorphism group of an infinite rooted tree. A major problem in arithmetic dynamics is to find conditions that guarantee the index is finite; a complete answer would give a dynamical analogue of Serre's celebrated open image theorem. We solve the finite index problem for cubic polynomials over function fields by proving a complete list of necessary and sufficient conditions. For number fields, the proof of sufficiency is conditional on both the abc conjecture and a form of Vojta's conjecture. (Received August 07, 2017)