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Computing arboreal Galois groups of some cubic polynomials

Let K be a number field, let $f \in k(x)$ be a rational function of degree $d \geq 2$, and let $a \in K$. The roots of $f^n(z) - a$ are the n -th preimages of a under f , and they have the natural structure of a d -ary rooted tree T . The action of Galois gives a representation of the absolute Galois group of K in the automorphism group of T . In many cases, it is expected that the image of this arboreal Galois representation has finite index in the full automorphism group, but in some cases, such as when f is postcritically finite (PCF), the image is known to have infinite index. In this talk, we present some new examples where the arboreal Galois group can be computed completely.