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Ramification in iterated extensions of number fields

Cyclotomic extensions, and torsion extensions for elliptic curves, give examples of infinite towers of number fields ramified only above a finite set of primes. Aitken, Cullinan, Hajir, and Maire showed that the splitting fields of iterates of post-critically finite rational functions of one variable have the same property, which is in some sense a direct generalization of the aforementioned cases. We will survey these results, and related questions in Galois theory. We will also present a generalization of, and a converse to, their theorem.