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Local-to-Global Extensions for Wildly Ramified Covers of Curves.

Given a Galois cover of curves $X \rightarrow Y$ with Galois group G which is totally ramified at a point x and unramified elsewhere, restriction to the punctured formal neighborhood of x induces a Galois extension of Laurent series rings $k((u))/k((t))$. If we fix a base curve Y , we can ask when a Galois extension of Laurent series rings comes from a global cover of Y in this way. Harbater proved that over a separably closed field, every Laurent series extension comes from a global cover for any base curve if G is a p -group, and he gave a condition for the uniqueness of such an extension. Using a generalization of Artin–Schreier theory to non-abelian p -groups, we fully characterize the curves Y for which this extension property holds and for which it is unique up to isomorphism, but over a more general ground field. We also use our explicit characterization of Galois covers of curves to work toward a characterization of ramification filtrations of p -group extensions. (Received September 16, 2019)