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A bijection in prime characteristic algebra. Preliminary report.

Let R be a reduced commutative Noetherian ring of prime characteristic $p > 0$. Let R^∞ denote the perfect closure of R wherein the Frobenius map $f : R^\infty \rightarrow R^\infty$, $f(r) = r^p$ is bijective. The extension $R \rightarrow R^\infty$ has two important qualities: *a*) the map $f : \text{Spec}(R^\infty) \rightarrow \text{Spec}(R)$ where $f(Q) = Q \cap R$ is a bijection, and *b*) R^∞ will no longer retain Noetherianness. The concept of an associated prime will generalize in the extension to weakly associated primes and strong Krull primes, which arise in the non-Noetherian context. In this talk we will investigate an arbitrary ideal $I = (x_1, x_2, \dots, x_n) \subset R$ and find a one-to-one correspondence between the strong Krull primes (over R^∞) of its extension IR^∞ , and associated primes of Frobenius closures of $I^{[q]} = (x_1^q, x_2^q, \dots, x_n^q) \subset R$ for $q = p^e$ with $e \in \mathbb{N}$. Furthermore, we generalize to strong Krull primes $\text{sK}_{R^\infty}(R^\infty \otimes_R M)$ for any finitely generated R -module M , with a similar result. (Received January 20, 2015)