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George E Whelan* (gwhelan@masonlive.gmu.edu). *Generalized Associated Primes and Depth in the Perfect Closure*. Preliminary report.

Let (R, m) be a local ring and M a module over R . If R is not Noetherian, the concept of an associated prime of M generalizes to definitions of weakly associated primes and strong Krull primes. Similarly the notion of depth requires finer definitions, which were first investigated by Barger and Hochster in the 1970s. In this talk we will establish the relationship between these prime ideals and their corresponding types of depth.

Here we will let (R, m) be a Noetherian ring of characteristic $p > 0$, and we investigate the perfect closure R^∞ . The extension $R \rightarrow R^\infty$ has two relevant features: 1) the map $\text{Spec}(R^\infty) \rightarrow \text{Spec}(R)$ is an order isomorphism, and 2) R^∞ is almost always Non-Noetherian. We will discuss an arbitrary ideal $I \subset R$ and find a direct correspondence between the strong Krull primes of the cyclic module R^∞/IR^∞ and the associated primes of $R/(I^{[p^e]})^F$ for $e \in \mathbb{N}$. We will consider corresponding notions of depth, and generalize the results to $(R^\infty \otimes M)$ for a finitely generated R -module M . (Received September 22, 2015)