Hailong Dao and Ilya Smirnov* (is6eu@virginia.edu). A generalization of Hilbert-Kunz multiplicity.

Let \((R, \mathfrak{m})\) be a local ring of characteristic \(p > 0\) and \(M\) a finitely generated \(R\)-module. We study the existence of the limit:

\[
\lim_{n \to \infty} \frac{\ell(H^n_\mathfrak{m}(F^n(M)))}{p^n \dim R}
\]

where \(F(-)\) is the Peskine-Szpiro functor.

We prove that, if \(R\) is a complete intersection isolated singularity, then the limit is 0 if and only if the projective dimension of \(M\) is less than the Krull dimension of \(R\). As a consequence, we show that Frobenius is asymptotically rigid. (Received September 16, 2013)