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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: $\lim_{n \rightarrow \infty} \frac{\ell(\mathrm{H}_{\mathfrak{m}}^0(F^n(M)))}{p^{n \dim R}}$ 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)