1099-13-235 **Hailong Dao***, Department of Mathematics, University of Kansas, 405 Snow Hall, 1460 Jayhawk Blvd, Lawrence, KS 66045. *Higher Hilbert-Kunz theory.*

(Joint work with I. Smirnov and K. Watanabe) Let (R, m) be a ring of positive characteristic with $d = \dim R$ and I be an ideal in R which is m-primary. The classical Hilbert-Kunz multiplicity is the limit of $\frac{\lambda(R/I^{[p^e]})}{p^{de}}$ as e tends to infinity. In our work we consider any finitely generated module M, and replace the length of $R/I^{[p^e]}$ by the length of some local cohomology of the module $F^e(M)$, here F is the Peskine-Szpiro functor. This generalizes the classical notion in many ways. We can prove that the limit exists over isolated singularities (with some mild extra conditions) and more interestingly, classify when the limit is 0 over complete intersections or F-regular rings. Some applications will be discussed. (Received February 10, 2014)