1015-13-286   **Ian M Aberbach*** (`aberbach@math.missouri.edu`), Department of Mathematics, University of Missouri, Columbia, MO 65211, and **Florian Enescu**. *More on rings of small Hilbert-Kunz multiplicity.* Preliminary report.

Let (R, m, k) be a complete, local, reduced ring of positive prime characteristic p and dimension d. The Hilbert-Kunz multiplicity of R is $e_{HK}(R) = \lim_{p^e \to \infty} \lambda(R/m^{[p^e]})/q^d$. R is regular if and only if $e_{HK}(R) = 1$. The question under investigation is: How small can $e_{HK}(R)$ be if R is not regular (as a function of d)? There is a conjectured lower bound, but except in the case of very small dimension, and the case of complete intersections, the bound is not known to hold.

We will give a lower bound for non-Gorenstein rings (which may be a weaker bound than the general conjecture), which as a corollary, allows one to conclude that all rings of sufficiently small Hilbert-Kunz multiplicity are strongly F-regular (again, "sufficiently small" depends on d).

We will also discuss some formulas that will work to give a lower bound when R is nice enough (e.g. the localization of a graded ring), and the multiplicity of R is not "too small." (Received February 07, 2006)