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Jinjia Li* (jli32@syr.edu), Department of Mathematics, Syracuse University, 215 Carnegie,
Syracuse, NY 13244. *Characterizations of Regular Local Rings in Positive Characteristics.*

We provide several new characterizations of regular local rings in positive characteristics, in terms of the higher Tor counterparts of the Hilbert-Kunz multiplicity. We also apply the characterizations to obtain a slight improvement, in the characteristic p case, of a recent result by Bridgeland and Iyengar. Our proof avoids the use of the existence of big Cohen-Macaulay modules, which is the major tool in the proof of Bridgeland and Iyengar. (Received January 03, 2007)