1056-13-774 **Karl Schwede*** (`kschwede@umich.edu`), Department of Mathematics, University of Michigan, Ann Arbor, MI 48103. *Test ideals in non-Q-Gorenstein rings.*

Given an F-finite reduced ring R of positive characteristic $p > 0$, one can define the associated big test ideal $\tau_b(R)$. This is the ideal generated by all test elements for all tight closure operations in all modules.

If R is reduced generically from a normal $\mathbb{Q}$-Gorenstein ring R_0 of characteristic zero, then the big test ideal $\tau_b(R)$ coincides with the multiplier ideal of R_0 (also reduced from characteristic zero). However, if R_0 is not $\mathbb{Q}$-Gorenstein, then the multiplier ideal is not (typically) defined. One way around this issue is to define multiplier ideals for pair (R_0, Δ) where Δ is a $\mathbb{Q}$-divisor on Spec R_0 such that $K_{R_0} + \Delta$ is $\mathbb{Q}$-Cartier.

On the other hand, inspired by the characteristic zero theory, S. Takagi defined the test ideal $\tau(R, \Delta)$ in positive characteristic for pairs (R, Δ) where Δ is an effective $\mathbb{Q}$-divisor on Spec R. In this talk, we will discuss the following result.

$$\tau_b(R) = \sum_{\Delta} \tau(R, \Delta)$$

where the sum is over Δ such that $K_R + \Delta$ is $\mathbb{Q}$-Cartier. This affirmatively answers a question asked by several people including Blickle, Lazarsfeld, K. Lee, and K. Smith. (Received September 17, 2009)