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A canonical linear system associated to adjoint divisors in characteristic \$p > 0\$

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Suppose that \$X\$ is a projective variety over an algebraically closed field of characteristic \$p > 0\$. Further suppose that \$L\$ is an ample (or more generally in some sense positive) divisor. We study a natural linear system in $K_X + L$. We further generalize this to incorporate a boundary divisor Delta\$. We show that these subsystems behave like the global sections associated to multiplier ideals, \$H^0(X, \mJ(X, \Delta) \tensor L)\$ in characteristic zero. In particular, we show that these systems are in many cases base-point-free. While the original proof utilized Kawamata-Viehweg vanishing and variants of multiplier ideals, our proof uses test ideals.

Comments: 15 pages, improved exposition and typos corrected, to appear in Journal f\"ur die reine und angewandte Mathematik Subjects: Algebraic Geometry (math.AG); Commutative Algebra (math.AC) MSC classes: 14F18, 13A35, 14B05 Cite as: arXiv:1107.3833 [math.AG]

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