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The non-vanishing theorem. (English. Russian original) Zbl 0605.14006

Math. USSR, Izv. 26, 591-604 (1986); translation from Izv. Akad. Nauk SSSR, Ser. Mat. 49, No. 3, 635-651 (1985).

The main result is the following non-vanishing theorem. Let X be a variety with routine (= log-terminal) singularities, D a nef (numerically effective) Cartier divisor and $A = \sum d_i D_i^a$ $\mathbb{Q}$-Cartier divisor on X. Suppose that the following conditions hold: (a) The $\mathbb{Q}$-divisor $aD + A - K_X$ is nef and big for some $a \in \mathbb{Q}$. (b) The D_i are prime divisors on X, and are nonsingular, have normal crossings, and lie in the nonsingular part of X if $d_i < 0$. (c) Each $d_i > -1$. then for all $b \gg 0 : H^0(X, \mathcal{O}_X(bD + \ulcorner A \urcorner)) \neq 0$, or, in other words, $|bD + \ulcorner A \urcorner| \neq \emptyset$, where for $x \in \mathbb{R}$, "$\ulcorner x \urcorner$" means the smallest integer $\geq x$, and for a divisor $D = \sum d_i F_i : \ulcorner D \urcorner = \sum \ulcorner d_i \urcorner F_i$.

This theorem is motivated by and used in the extremological program of *Miles Reid* for the construction of minimal models.

Reviewer: V.Iliev

MSC:

14C20 Divisors, linear systems, invertible sheaves
14F25 Classical real and complex (co)homology in algebraic geometry
14E30 Minimal model program (Mori theory, extremal rays)

Keywords:

Mori extremal rays; nef Cartier divisor; non-vanishing theorem

Full Text: DOI