Birkar, Caucher

On existence of log minimal models. II. (English) Zbl 1226.14021

J. Reine Angew. Math. 658, 99-113 (2011).

Let (X,B) be a projective log canonical pair (e.g. X is smooth and $B=\sum b_iB_i$ is a sum of smooth codimension one subvarieties meeting transversely with $0\leq b_i\leq 1$). (X,B) is pseudo-effective if there is a sequence of effective divisors $M_i\geq 0$ such that $K_X+B=\lim_{i\to\infty}M_i$. According to the Minimal Model Conjecture, if (X,B) is pseudo-effective, then it has a minimal model $\phi: X \dashrightarrow Z$ (in particular $K_Z+\phi_*B$ is nef so that $(K_Z+\phi_*B)\cdot C\geq 0$ for any curve $C\subset X$) and if (X,B) is not pseudo-effective, then it has a Mori fiber space (in particular there is a birational map $\phi: X\dashrightarrow Z$ and a morphism $Z\to W$ such that $-(K_Z+\phi_*B)$ is ample over W). The Weak Nonvanishing Conjecture says that any pseudo-effective log canonical pair (X,B) is effective so that $K_X+B\equiv M\geq 0$.

In this paper, the author shows the important result that the Weak Nonvanishing Conjecture implies the Minimal Model Conjecture and that if (X,B) is a $\mathbb{Q}$-factorial dlt pair, then the birational map $\phi: X\dashrightarrow Z$ to the minimal model (or Mori fiber space) is given by a finite sequence of divisorial contractions and flips.

For part I, cf. [Compos. Math. 146, No. 4, 919–928 (2010; Zbl 1197.14011)].

Reviewer: Christopher Hacon (Salt Lake City)

MSC:

14E30 Minimal model program (Mori theory, extremal rays)

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