

Bonavero, Laurent; Casagrande, Cinzia; Debarre, Olivier; Druel, Stéphane

On a conjecture of Mukai. (Sur une conjecture de Mukai.) (French) Zbl 1044.14019
Comment. Math. Helv. 78, No. 3, 601-626 (2003).

The authors use the following notations: X – a Fano variety, ρ_X – its Picard number, r_X – the index of X , the largest integer m such that $K_X = m \cdot L$ holds in the Picard group of X , and ι_X – the pseudo index, the smallest intersection number of the form $(-K_X) \cdot C$ with C a rational curve in X .

Mukai conjectured that the inequality $\rho_X(r_X - 1) \leq \dim(X)$ holds. The authors generalize this conjecture to

$$\rho_X(\iota_X - 1) \leq \dim(X)$$

and prove it for the following cases:

X is a Fano variety of dimension ≤ 4 , X is a toric variety of dimension ≤ 7 , and X is toric and satisfies $\iota_X \geq \frac{\dim(X)+3}{3}$.

The proof uses techniques of Mori and from the theory of toric varieties. It uses extremal contractions, chains of rational curves, families of rational curves and the pairing between $N_{1(X)}$ and $\text{Pic}(X)$.

Reviewer: [Georg Hein \(Berlin\)](#)

MSC:

[14J45](#) Fano varieties
[14E30](#) Minimal model program (Mori theory, extremal rays)
[14M25](#) Toric varieties, Newton polyhedra, Okounkov bodies

Cited in **8** Reviews
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