

Nikulin, V. V.

Del Pezzo surfaces with log-terminal singularities. III. (English. Russian original)

[Zbl 0711.14018](#)

Math. USSR, Izv. 35, No. 3, 657-675 (1990); translation from *Izv. Akad. Nauk SSSR, Ser. Mat.* 53, No. 6, 1316-1334 (1989).

[For part I of this paper see *Math. USSR, Sb.* 66, No.1, 231-248 (1990); translation from *Mat. Sb.* 180, No.2, 226-243 (1989; [Zbl 0674.14024](#)); for part II see *Math. USSR, Izv.* 33, No.2, 335-372 (1989); translation from *Izv. Akad. Nauk SSSR, Ser. Mat.* 52, No.5, 1032-1050 (1988; [Zbl 0677.14008](#)).]

For the definitions and notation we refer to our review of part I. In part II the author proved that for a minimal desingularisation $\sigma : Y \rightarrow Z$ of a complex log-del Pezzo surface Z with a fixed index k , the Picard number $\rho(Y)$ of Y could be estimated from above by a constant depending on k only. In particular the number of the intersection diagrams of exceptional curves on Y is finite.

In this part III of the paper the author shows that the theorem formulated above is true if we replace k with the multiplicity e of Z . This result is stronger than the previous one and the author considers e more geometrical than k . It is also shown that all the results of the previous parts are true over any algebraically closed field. Another theorem says that a similar estimation of $\rho(Y)$ takes place for a wider class of surfaces which contains for example non-minimal $K3$ surfaces.

The methods used are as in the previous parts, they come from the theory of reflection group in Lobachevsky spaces. The author formulates a conjecture, that these methods can be generalised for higher dimensions and that similar results can be obtained for Fano manifolds of dimension higher than 2 and with log-terminal singularities. Finally he mentions his preprint in which he generalises the present results to projective surfaces with log-terminal singularities and with a nef anticanonical class.

Reviewer: [K.Dabrowski](#)

MSC:

- [14J17](#) Singularities of surfaces or higher-dimensional varieties
- [14C20](#) Divisors, linear systems, invertible sheaves
- [14C22](#) Picard groups
- [14J25](#) Special surfaces
- [51F15](#) Reflection groups, reflection geometries
- [14E15](#) Global theory and resolution of singularities (algebraic-geometric aspects)

Cited in **1** Review
Cited in **4** Documents

Keywords:

Mori theory; desingularisation; log-del Pezzo surface; index; Picard number; multiplicity; non-minimal $K3$ surfaces; reflection group; Fano manifolds; log-terminal singularities; nef anticanonical class

Full Text: [DOI](#)