Ohno, Masahiro

Classification of generalized polarized manifolds by their nef values. (English) Zbl 1138.14026

Adv. Geom. 6, No. 4, 543-599 (2006).

The paper under review deals with generalized polarized manifold, i.e., pairs $(M, \mathcal{E})$ with M an n-dimensional complex projective manifold and $\mathcal{E}$ an ample vector bundle of rank r on X.

Problems related to the nefness and the ampleness of the line bundle $K_M + \det \mathcal{E}$, in case $r \geq n-2$ have been considered by many authors; we refer the reader to the paper's introduction for an accurate overview on previous results.

In the present paper the author studies pairs $(M, \mathcal{E})$ as above from a slightly different view point, considering the nef value τ of the pair, which is the minimum real number t such that the line bundle $K_M + t \det \mathcal{E}$ is nef, and giving a classification of the pairs such that $\tau r \geq n-2$.

The case $\tau r \geq n-1$ was previously considered by the author in [RIMS Kokyuroku 1078, 75–85 (1999; Zbl 0954.14006)]. The proof is based on a case by case analysis of the extremal contraction of the manifold M, using traditional results and techniques of Mori theory as well as recent results as the characterization of the projective space given by Cho, Miyaoka and Shepherd Barron and Kebekus.

Some minor improvements and corrections have been published in an Addendum [Adv. Geom. 7, No. 2, 315–316 (2007; Zbl 1141.14312)].

Reviewer: Gianluca Occhetta (Trento)

MSC:

14J60 Vector bundles on surfaces and higher-dimensional varieties, and their moduli
14N30 Adjunction problems
14J40 n-folds ($n > 4$)
14E30 Minimal model program (Mori theory, extremal rays)

Keywords:
Nef value; ample vector bundles; extremal contractions

Full Text: DOI arXiv

References:

[1] DOI: 10.1007/s00229-002-0346-0 · Zbl 1045.14023 · doi:10.1007/s00229-002-0346-0
[2] DOI: 10.1142/S0129167X92000114 · Zbl 0770.14008 · doi:10.1142/S0129167X92000114
[3] Andreatta M., Preprint UTM pp 344– (1991)
[4] DOI: 10.1090/S0002-9947-97-01832-1 · Zbl 0885.14004 · doi:10.1090/S0002-9947-97-01832-1
[5] DOI: 10.1142/S0129167X99000276 · Zbl 1066.14501 · doi:10.1142/S0129167X99000276
[6] Andreatta M., Nagoya Math. J. 168 pp 127– (2002)
[7] DOI: 10.2307/2372597 · Zbl 0065.26103 · doi:10.2307/2372597
[8] Cho K., MR pp 14080– (1929)
[9] Elencwajg G., Ann. Inst. Fourier (Grenoble) 31 pp 89– (1981)
[10] Ellia P., S.) (7) pp 60– (1982)
[11] DOI: 10.2969/jmsj/03210153 · doi:10.2969/jmsj/03210153
[12] Fujita T., Stud. Pure Math. 167 pp 14006– (1987)
[13] Fujita T., Nagoya Math. J. 115 pp 105– (1989)
[14] Fujita T., Math. 105 pp 14052– (1992)
[15] DOI: 10.1017/S0305004100064409 · Zbl 0619.14004 · doi:10.1017/S0305004100064409

[16] Ishimura S., Sgaku 32 pp 365– (1980)

[17] Iskovskih V. A., Izv. Akad. Nauk SSSR Ser. Mat. 41 pp 516– (1977)

[18] Kawamata Y., Stud. Pure Math. 283 pp 14015– (1987)

[19] Kebekus S., MR pp 14065– (1922)

[20] Kebekus S., J. Algebraic Geom. 11 pp 245– (2002)

[21] Kleiman S. L., Ann. of Math. 84 (2) pp 293– (2060)

[22] Kobayashi S., J. Math. Kyoto Univ. 13 pp 31– (1973)

[23] Kollár J., I. Ann. of Math. 123 pp 11– (2) · Zbl 0598.14015 · doi:10.2307/1971351

[24] Kollár J., Math. 100 pp 14039– (1992)

[25] Kollár J., J. Algebraic Geom. 1 pp 429– (1992)

[26] DOI: 10.1515/form.1997.9.1 · Zbl 0876.14026 · doi:10.1515/form.1997.9.1

[27] Lazarsfeld R., Math. 29 pp 14013– (1984)

[28] Maeda H., Matematiche (Catania) 50 pp 73– (1995)

[29] Mori S., Ann. of Math. 110 pp 593– (2) · Zbl 0423.14006 · doi:10.2307/1971241

[30] Mori S., Ann. of Math. 116 pp 133– (2) · Zbl 0557.14021 · doi:10.2307/2007050

[31] Ohno M., Su-rikaisekikenkyu-sho Ko-kyu-roku (1078) pp 75– (1999)

[32] Okonek C., MR56 pp 14001– (1910)

[33] DOI: 10.2307/2000764 · Zbl 0657.14006 · doi:10.2307/2000764

[34] DOI: 10.1007/BF02571257 · Zbl 0726.14034 · doi:10.1007/BF02571257

[35] DOI: 10.1142/S0129167X91000181 · Zbl 0744.14009 · doi:10.1142/S0129167X91000181

[36] DOI: 10.1007/BF01934319 · Zbl 0786.14027 · doi:10.1007/BF01934319

[37] DOI: 10.1007/BF01419597 · Zbl 0215.43202 · doi:10.1007/BF01419597

[38] DOI: 10.1007/BF01215656 · Zbl 0668.14004 · doi:10.1007/BF01215656

[39] Winiewski J. A., J. Reine Angew. Math. 417 pp 141– (1991)

[40] DOI: 10.1215/S0012-7094-90-06027-2 · Zbl 0709.14011 · doi:10.1215/S0012-7094-90-06027-2