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Tian's invariant of the Grassmann manifold. (English, French summaries)

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Tian's invariant is of special interest in the study of Kähler-Einstein metrics with positive first Chern class. In this paper, the author proves that it is equal to $\frac{1}{p+q}$ for the complex Grassmann manifold $G_{p,q}(\mathbb{C})$, which is the natural generalization of the classical result for complex projective spaces.

The structure of $G_{p,q}(\mathbb{C})$ plays a crucial role in the argument, and the author also makes use of an imbedding of $(\mathbb{P}^1(\mathbb{C}))^p$ in $G_{p,q}(\mathbb{C})$. During the process, a nice description of the Grassmann manifold and a concise summary of general results on Tian's invariant are included for the reader's convenience. Zhou Zhang

References

1. Aubin, T. Équations du type Monge-Ampère sur les variétés kählériennes compactes, *Bull. Sci. Math.* **102**, 63–95, (1978). [MR0494932 \(81d:53047\)](#)
2. Aubin, T. Réduction du cas positif de l'équation de Monge-Ampère sur les variétés kählériennes compactes à la démonstration d'une inégalité, *J. Funct. Anal.* **57**, 143–153, (1984). [MR0749521 \(85k:58084\)](#)
3. Aubin, T. Métriques d'Einstein-Kähler et exponentiel de fonctions admissibles, *J. Func. Anal.* **88**, 385–394, (1990). [MR1038448 \(91d:32041\)](#)
4. Aubin, T. *Some Nonlinear Problems in Riemannian Geometry*, Springer-Verlag, Berlin, (1998). [MR1636569 \(99i:58001\)](#)
5. Ben Abdesselen, A. Lower bound of admissible functions on sphere, *Bull. Sci. Math* **126**, 675–680, (2002). [MR1944392 \(2003k:32035\)](#)
6. Ben Abdesselen, A. Enveloppes inférieures de fonctions admissibles sur l'espace projectif complexe. Cas symétrique, to appear in *Differential Geom. Appl.*
7. Ben Abdesselen, A. and Cherrier, P. Einstein-Kähler metrics on a class of bundles involving integral weights, *J. Math. Pures Appl.* **3**(81), 259–281, (2002). [MR1894064 \(2003a:32040\)](#)
8. Ben Abdesselen, A. and Cherrier, P. Estimations of Ricci tensor on certain Fano manifolds, *Math. Z.* **233**, 481–505, (2000). [MR1750933 \(2001g:32056\)](#)
9. Futaki, A. An obstruction to the existence of Kähler-Einstein metrics, *Invent. Math.* **73**, 437–443, (1983). [MR0718940 \(84j:53072\)](#)
10. Kobayashi, S. and Nomizu, K. *Foundations of Differential Geometry*, Vol. II, John Wiley & Sons, (1969). [MR1393941 \(97c:53001b\)](#)
11. Lichnerowicz, A. Sur les transformations analytiques des variétés kählériennes, *Cr. Acac. Sci.* **244**, 3011–3014, (1957). [MR0094479 \(20 #996\)](#)
12. Matsushima, Y. Sur la structure du groupe d'homéomorphismes analytiques d'une certaine variété kählérienne, *Nagoya Math. J.* **11**, 145–150, (1957). [MR0094478 \(20 #995\)](#)
13. Real, C. Métriques d'Einstein-Kähler sur des variétés à première classe de Chern positive, *J. Func. Anal.* **106**, 145–188, (1992). [MR1163468 \(93g:32043\)](#)
14. Tian, G. On Kähler-Einstein metrics on certain Kähler manifolds with $C^1(M) > 0$, *Invent. Math.* **89**, 225–246, (1987). [MR0894378 \(88e:53069\)](#)
15. Yau, S. T. On the Ricci curvature of a compact Kähler manifold and the com-

plex Monge-Ampère equations, I, *Comm. Pure Appl. Math.* **31**, 339–411, (1978).
[MR0480350 \(81d:53045\)](#)

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