



Geometry Webinar AmSur/AmSul

Levi-Civita Ricci-flat metrics on compact Hermitian Weyl-Einstein manifolds

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Resumo: As shown in [2], the first Aeppli-Chern class of a compact Hermitian manifold can be represented by its first Levi-Civita Ricci curvature. From this, a natural question to ask (inspired by the Calabi-Yau theorem [3]) is the following: On a compact complex manifold with vanishing first Aeppli-Chern class, does there exist a smooth Levi-Civita Ricci-flat Hermitian metric? In general, it is particularly challenging to solve the Levi-Civita Ricci-flat equation, since there are non-elliptic terms involved in the underlying PDE problem. In this talk, we will investigate the above question in the setting of compact Hermitian Weyl-Einstein manifolds. The main purpose is to show that every compact Hermitian Weyl-Einstein manifold admits a Levi-Civita Ricci-flat Hermitian metric [1]. This result generalizes previous constructions on Hopf manifolds [2]. [1] Correa, E. M.; Levi-Civita Ricci-flat metrics on non-Kähler Calabi-Yau manifolds, arxiv:2204.04824v3 (2022). [2] Liu, K.; Yang, X.; Ricci curvatures on Hermitian manifolds, Trans. Amer. Math. Soc. 369 (2017), no. 7, 5157-5196. [3] Yau, S.-T.; On the Ricci curvature of a compact Kähler manifold and the complex Monge-Ampère equation. I, Comm. Pure Appl. Math. 31 (1978), no. 3, 339-411. MR480350.

[1] Correa, E. M.; Levi-Civita Ricci-flat metrics on non-Kähler Calabi-Yau manifolds, arxiv:2204.04824v3 (2022).

[2] Liu, K.; Yang, X.; Ricci curvatures on Hermitian manifolds, Trans. Amer. Math. Soc. 369 (2017), no. 7, 5157-5196.



[3] Yau, S.-T.; On the Ricci curvature of a compact Kähler manifold and the complex Monge-Ampère equation. I, Comm. Pure Appl. Math. 31 (1978), no. 3, 339-411. MR480350.