

Noncompact Steady Quasi-Einstein Manifolds

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Resumo/Abstract:

A classical problem in Riemannian geometry is to construct new explicit examples of Einstein metrics. A promising way for that purpose is that of warped products. In this spirit, m -quasi-Einstein manifolds are useful as an attempt to better understand Einstein warped products. We point out that ∞ -quasi-Einstein manifold means a gradient Ricci soliton. Ricci solitons model the formation of singularities in the Ricci flow and correspond to self-similar solutions. However, the remarkable motivation to study quasi-Einstein metrics on a Riemannian manifold is its direct relation with the existence of Einstein warped product. We also highlight that 1-quasi-Einstein manifolds are more commonly called *static metrics* and such metrics have connections to scalar curvature, the positive mass theorem and general relativity.

In this talk, we shall show that complete noncompact steady quasi-Einstein manifolds must be connected at infinity. Moreover, we provide some volume estimates for noncompact quasi-Einstein manifolds similar to a classical result due to Calabi and Yau. In addition, we prove that a Bach-flat noncompact steady quasi-Einstein manifold with positive Ricci curvature must be a warped product with Einstein fiber.

References

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