Complete quasi-Einstein manifolds with constant scalar curvature and zero radial Weyl curvature

Giulio Colombo
Department of Mathematics, The University of Milan, Italy
giulio.colombo@unimi.it

Quasi-Einstein manifolds are Riemannian manifolds (M, g) supporting a positive non-constant smooth function u satisfying

$$u \operatorname{Ric} = k \operatorname{Hess} u + \lambda u \, g$$

for some constants $k, \lambda \in \mathbb{R}$. These manifolds arise naturally (for positive integer values of k) as bases of Einstein warped products. In this talk I will present some new results [1] concerning the structure of complete quasi-Einstein manifolds having constant scalar curvature and vanishing Weyl curvature in the direction of the gradient ∇u. The proofs rely on studying the geometry of the foliation given by the level sets of u. Our findings improve on previous results by He, Petersen and Wylie [2] who considered more restrictive vanishing conditions on curvature tensors.

Acknowledgements

Based on joint works with Filippo Mastropietro, Livio Pizzocchero and Marco Rigoli.

References

[1] G. Colombo, F. Mastropietro, L. Pizzocchero, M. Rigoli, *Complete quasi-Einstein manifolds with constant scalar curvature*, preprint.

[2] C. He, P. Petersen, W. Wylie, *Warped product Einstein metrics over spaces with constant scalar curvature*, Asian J. Math., **18**, no. 1, (2014), pp. 159–190.