

On special classes of transversely Kähler almost contact metric manifolds

Giulia Dileo

Department of Mathematics, University of Bari Aldo Moro, Italy

giulia.dileo@uniba.it

I will discuss some special classes of almost contact metric manifolds $(M^{2n+1}, \varphi, \xi, \eta, g)$ such that the transverse geometry with respect to the 1-dimensional foliation generated by characteristic vector field ξ is given by a Kähler structure. I will focus on quasi-Sasakian manifolds, introduced by Blair in [1], and on the new class of anti-quasi-Sasakian manifolds [4, 3]. In this case, the transverse geometry is given by a Kähler structure endowed with a closed 2-form of type $(2, 0)$. I will show how these manifolds can be placed in framework of the Chinea-Gonzalez classification of almost contact metric manifolds [2], and describe examples of anti-quasi-Sasakian manifolds, including compact nilmanifolds, principal circle bundles, and manifolds which are transversely hyperkähler. I will discuss geometric properties of anti-quasi-Sasakian manifolds and some obstructions to their existence.

Acknowledgements

Joint work with Dario Di Pinto (Centro de Matemática da Universidade de Coimbra, Portugal).

References

- [1] D. E. Blair, *The theory of quasi-Sasakian structures*, J. Differential Geom. **1** (1967), 331-345.
- [2] D. Chinea, C. Gonzalez, *A classification of almost contact metric manifolds*, Ann. Mat. Pura Appl. (IV) **CLVI** (1990), 15-36.
- [3] D. Di Pinto, *On anti-quasi-Sasakian manifolds of maximal rank*, J. Geom. Phys. **200** (2024), Paper No. 105174, 10 pp.
- [4] D. Di Pinto, G. Dileo, *Anti-quasi-Sasakian manifolds*, Ann. Global Anal. Geom. **64** (2023), no. 1, Paper No. 5, 35 pp.