

# A structure theorem for co-Kähler manifolds

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**Abstract.** Co-symplectic and co-Kähler structures are the odd-dimensional analogue of symplectic and Kähler structures. In this talk we shall review the basic concepts of both geometries, which are a special case of almost contact metric structures [2]. We will prove a structure theorem for compact co-Kähler manifolds, stating that they are finally covered by the product of a compact Kähler manifold and a circle. This allows us to recover in a very simple way all the known topological properties of co-Kähler manifolds. As an application, we shall show that in every odd dimension there exists a compact co-Kähler manifold which is not the product of a Kähler manifold and a circle. The results are contained in [1] and are obtained in collaboration with J. Oprea.

## References

- [1] G. Bazzoni and J. Oprea, On the structure of co-Kähler manifolds. *Preprint arXiv:1209.3373* (2013), to appear in *Geom. Dedicata*.
- [2] D. Blair, *Riemannian Geometry of Contact and Symplectic Manifolds*. Progr. Math. vol. 203, Birkhäuser, Boston, 2010.