

# Tachibana and Nomizu-Smyth type theorems on $k$ -positively curved manifolds

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By elaborating on the recent approach of P. Petersen and M. Wink to improved curvature conditions for the Bochner technique, we show that Tachibana’s rigidity theorem for closed  $n$ -dimensional Riemannian manifolds with non-negative curvature operator and harmonic curvature tensor holds as well for manifolds with  $\lfloor \frac{n-1}{2} \rfloor$ -non-negative curvature operator (as already proved by Petersen and Wink in the special case of Einstein manifolds), and we discuss some extensions to the case of complete manifolds. In the same vein, we present generalizations of classical classification theorems by Nomizu-Smyth and Nakagawa-Yokote for closed hypersurfaces of non-negative curvature immersed in  $\mathbb{S}^{n+1}$  with either constant mean curvature or constant scalar curvature.

## Acknowledgements

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## References

- [1] G. Colombo, M. Mariani, M. Rigoli, *Tachibana-type theorems on complete manifolds*, Ann. Sc. Norm. Super. Pisa Cl. Sci., **25** (2) (2024) 1033–1083.