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5. Differential Geometry and Global Analysis

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Şentürk, Zerrin, Istanbul Technical University, TURKEY

On a Certain Application of the Patterson's Curvature Identity

In this work, we investigate arbitrary 4-dimensional semi-Riemannian manifolds fulfilling the condition"the tensors $R \cdot C$ and $Q(S, C)$ are linearly dependent". We consider 4-dimensional manifolds satisfying the equality $Q(S, C = 0$ and we prove that such manifolds are semisymmetric and their scalar curvature is equal to zero. Finally, we describe an example of a manifold having all these properties. Part of these results is joint work with R. Deszcz and M. Hotloś.

Reference: E. M. Patterson, A class of critical Riemannian metrics, *J. London Math. Soc.* **2, 23** (1981), 349–358.