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Stanilov-Tsankov-Videv Theory

Abstract: Let R be the curvature operator, let J be the Jacobi operator, and let p be the Ricci operator of a pseudo-Riemannian manifold M. One studies commutativity properties of these operators - for example M is said to be Jacobi-Videv if J(x)p = pJ(x) for all x and skew-Tsankov if R(x,y)R(z,w) =R(z,w)R(x,y) for all x, y, z, w. We examine how these purely algebraic properties are related to the underlying geometry of the manifold and we present a number of examples are presented in the context of Walker geometry.