Curvature properties of some class of warped product manifolds

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Warped product manifolds of dimension $n \geq 4$, with p-dimensional base, $p = 1, 2$, satisfy some pseudosymmetry type curvature conditions. These conditions are formed from the metric tensor g, the Riemann-Christoffel curvature tensor R, the Ricci tensor S and the Weyl conformal curvature C of the considered manifolds. In particular, if $p = 2$ and the fiber is a semi-Riemannian space of constant curvature (when $n \geq 5$) then the $(0,6)$-tensors $R \cdot R - Q(S,R)$ and $C \cdot C$ of such warped products are proportional to the $(0,6)$-tensor $Q(g,C)$ and the tensor C is a linear combination of some Kulkarni-Nomizu products formed from the tensors g and S. We also present curvature properties of this kind of quasi-Einstein and 2-quasi-Einstein manifolds, and in particular, of the Gödel metric, generalized spherically symmetric metrics and generalized Vaidya metrics. Our talk bases on [1–6].

Joint work with Małgorzata Głogowska and Jan Jełowicki (Wrocław).

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