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].

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