CURVATURE PROPERTIES OF SOME WARPED PRODUCT MANIFOLDS

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Dedicated to the memory of Professor Witold Roter

ABSTRACT

In this poster we will present curvature properties of pseudosymmetry type of the warped product manifolds $\overline{M}\times_F\widetilde{N}$ with p-dimensional base manifold $(\overline{M},\overline{g})$, $p=1,2$, $(n-p)$-dimensional fiber $(\widetilde{N},\widetilde{g})$, $n\geq 4$, and the warping function F. These conditions are formed from the metric tensor g, the Riemann-Christoffel curvature tensor R, the Ricci tensor S and the Weyl conformal curvature tensor C of the considered manifolds. For instance, if $p=1$ and the fiber $(\widetilde{N},\widetilde{g})$, $n\geq 5$, is an Einstein manifold, not of constant curvature, then $\overline{M}\times_F\widetilde{N}$ is a non-conformally flat quasi-Einstein Ricci-pseudosymmetric manifold and its difference tensor $R\cdot C-C\cdot R$ is a linear combination of the Tachibana tensors $Q(S,R)$ and $Q(g,R)$. If $p=2$ and the fiber $(\widetilde{N},\widetilde{g})$, $n\geq 5$, is a space of constant curvature then the $(0,6)$-tensors $R\cdot R-Q(S,R)$ and $C\cdot C$ of such warped product manifolds are proportional to the Tachibana tensor $Q(g,C)$, and the tensor C is a linear combination of some Kulkarni-Nomizu products formed from the tensors g, S and S^2. [1]

[1] **Mathematics Subject Classification (2010):** Primary 53B20, 53B25, 53B30, 53B50, 83C15; Secondary 53C25, 53C40, 53C80.

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