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CORRIGENDUM: ON A NEW KIND OF EINSTEIN WARPED PRODUCT (POLJ)-MANIFOLD

A. PIGAZZINI, C. ÖZEL†, P. LINKER AND S. JAFARI

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The paper [1] requires some corrections in our calculations, in particular we were wrong to consider the skew symmetry of the Riemann tensor, so the equations (2.5) and (2.7) in [1] become:

$$\begin{cases} \Delta f - \frac{c}{m} f^2 = 0 \\ (m+1)|\nabla f|^2 + \frac{c}{m} f^3 = 0 \end{cases}$$

We wrote $(m+1)$ instead $(m-1)$ because the skew symmetry of the Riemann curvature tensor causes one the terms in the trace to vanish, and since m must be negative, the terms is eliminated by adding 1. In this scenario the $(2,-2)$-POLJ manifold does not exist, but exists the (3,-3)-POLJ manifold. In case where $n = 3$, $m = -3$, $\lambda = \mu = 0$, $R_B = R_{f_B}$, $h \neq 0$ and by setting $x = (2/h)f$, the equations (2.8) and (2.9) in [1] become: (1) $\Delta x - 2x^2 = 0$ and (2) $|\nabla x|^2 - x^3 = 0$. The technique used remains the same as [1] and by performing the new calculations we obtain: (3) $\omega_2^2 + \omega_3^2 = x^{(1/2)}(Edy^2 + 2Fdydz + Gdz^2)$, for some functions E, F and G on the domain of the coordinate charte (x, y, z) that satisfy $EG - F^2 = 1$. Now assume that our metric has the form: (4) $g = x^{-3}dx^2 + (x^a dy)^2 + (x^b dz)^2$, then this is equivalent to having: (5) $2a + 2b - 1 = 0$ and the condition that $R_{f_B} + 6x = 0$ (i.e. the f-curvature-Base [2]), since the scalar curvature is: $R_B = -[2(a^2 + ab + b^2) + a + b]x$. Hence the equation becomes: (6) $6 - 2(a^2 + ab + b^2) - a - b = 0$. Since these two equations ((5) and (6)) are satisfied only for $a = 1$, $b = -1/2$, or $a = -1/2$, $b = 1$, then we have the following metric: $g = x^{-3}dx^2 + x^2dy^2 + x^{-1}dz^2$. Then our $(3,-3)$-POLJ manifold metric is: $ds^2 = x^{-3}dx^2 + x^2dy^2 + x^{-1}dz^2 - ((cx)^2/36)(d\xi^2 + d\varphi^2 + d\varrho^2)_{-3}$. We underline that the fiber-manifold (derived-manifold with negative dimension) is intended as $\mathbb{R}^d$ + bundle of obstruction ([3]), therefore on F we consider the valid Riemannian geometry defined on $\mathbb{R}^d$ paying attention to the dimension.

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Communicated by: Shiv.K.Kaushik
†Corresponding author.