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ERRATUM TO "A BERGER-GREEN TYPE INEQUALITY FOR COMPACT LORENTZIAN MANIFOLDS"

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The results of the paper [1] remain true as stated, but there is a mistake in the proof of Proposition 2.3, namely the assertion that the direct sum decomposition (2.1) is an orthogonal decomposition. This fact has also been used in the proofs of Proposition 2.4 and Theorem 2.6. The gaps should be amended as follows.

Proof of Proposition 2.3. Let $\mathbf{V} \in \mathfrak{X}(TM)$ be given by $\hat{g}(\mathbf{V}_v, X) = g(c(X), K_{\pi v}) + g(v, \nabla_{d\pi(X)}K)$, for every $X \in T_vTM$. Thus we have $\hat{g}(\mathbf{V}_v, \mathbf{A}_v) = 1$, at any $v \in C_K(M)$, and so $D_v = \mathrm{Span}\{\mathbf{V}_v, \mathbf{A}_v\}$ is a Lorentzian vector subspace of T_vTM (recall that $\hat{g}(\mathbf{A}, \mathbf{A}) = 0$ on C_KM). One easily checks that $X \in T_vC_KM$ if and only if $\hat{g}(\mathbf{A}_v, X) = \hat{g}(\mathbf{V}_v, X) = 0$. Therefore, $(C_KM, \hat{g})$ is a Lorentzian manifold. The proof for spacelike fibres remains valid.

Finally, $[T_v(C_KM)_p]^\perp = \{X \in T_vTM : c(X) = -g(v, \nabla_{d\pi(X)}K)\, v\}$, and so π restricted to C_KM is a semi-Riemannian submersion. □

Proof of Proposition 2.4. For every $v \in C_KM$, we put $\mathbf{K}_v = \mathbf{K}_v^T + \mathbf{K}_v^N$, with $\mathbf{K}_v^T \in T_vC_KM$ and $\mathbf{K}_v^N \in D_v$. Let $m \in \mathbb{N}$ be such that $\mathbf{K}^m = \mathbf{K}^N - m\mathbf{A}$ is a timelike vector field on an open neighbourhood $O \subset C_KM$ of v. Taking into account that $i_{\mathbf{K}^m} i_{\mathbf{A}}\Omega = i_{\mathbf{K}} i_{\mathbf{A}}\Omega$ on C_KM, we replace $\mathbf{K}$ in (2.8) by $\mathbf{K}^m$ and proceed as there to get the result on each O. □

The paragraph after Proposition 2.4 (Since...result.) must be deleted.

Proof of Theorem 2.6. The proof remains valid until the last formula: $c(X) = ... = \frac{\nabla J}{dt}\,|_0$. The remaining last sentence must be modified as follows. Thus, (2.12) and (2.11) yield $\mathfrak{L}_{Z_g}\beta_g(X) = (\rho \circ \pi)(v)\alpha_g(X) - 2\sigma_g(X)$ where $\sigma_g(X) = g(c(X), K_{\pi v})$. But $\sigma_g(Z_g) = 0$, and since for any $v \in C_KM$, $0 \neq Z_g(v) \in T_vC_KM$ and both $\alpha_g(Z_g)$, $i_{Z_g}(d\alpha_g)$ vanish on C_KM, the result easily follows from (2.10). □

References

[1] M. Gutiérrez, F. J. Palomo and A. Romero, A Berger-Green type inequality for compact Lorentzian manifolds, *Trans. Amer. Math. Soc.* **354** (2002), 4505-4523. MR **2003h:**53098

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