

Semi-Riemannian submersions and φ -null Osserman conditions on Lorentzian \mathcal{S} -manifolds

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We present some results obtained while studying certain properties of the Jacobi curvature operator ([3]), which are related with a new condition of Osserman-type (φ -null Osserman condition), recently introduced in [2] in a context involving Lorentzian $g.f.f$ -manifolds, together with semi-Riemannian submersions.

Namely, on a Lorentz \mathcal{S} -manifold $(M, \varphi, \xi_\alpha, \eta^\alpha, g)$, we first find a relationship between the φ -null Osserman condition and the classical Osserman condition ([3]), with respect to a unit tangent vector in $\text{Im}(\varphi)$ at a point $p \in M$. Then we use this result to examine some properties of projectability involving the φ -null Osserman condition in (toroidal) principal bundles with φ -null Osserman Lorentzian \mathcal{S} -manifolds as total space, and base space which can be either a Lorentzian Sasakian manifold or a Kählerian manifold (see also [1]). Some examples are given at the end.

References

- [1] L. Brunetti, A.M. Pastore, Some results on indefinite globally framed f -structures and toroidal principal bundles, *preprint*, 2010.
- [2] L. Brunetti, An Osserman-type condition on Lorentz \mathcal{S} -manifolds, *preprint*, 2011.
- [3] E. García-Río, D.N. Kupeli, R. Vázquez-Lorenzo, OSSERMAN MANIFOLDS IN SEMI-RIEMANNIAN GEOMETRY, Lecture Notes in Mathematics, 1777, Springer, Berlin, 2002.