

A note on the paper “On Invariant Submanifolds of LP -Sasakian Manifolds”

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Received August 16, 2012

Abstract: The object of the present paper is to find a counterexample to prove that every totally geodesic submanifold of an LP -Sasakian manifold need not be an invariant submanifold.

Key words: LP -Sasakian manifold, invariant submanifolds, totally geodesic.

AMS *Subject Class.* (2010): 53C15, 53C40.

REFERENCES

- [1] A. BEJANCU, N. PAPAGHUIC, Semi-invariant submanifolds of a Sasakian manifold, *An. Stiint. Univ. “Al. I. Cuza” Iasi Sect. I a Mat. (N.S.)* **27** (1981), 163–170.
- [2] U.C. DE, A. AL-AQUEAL, A.A. SHAIKH, Submanifolds of Lorentzian Para-Sasakian manifolds, *Bull. Malaysian Math. Soc. (2)* **28** (2005), 223–227.
- [3] U.C. DE, A.A. SHAIKH, Non-existence of proper semi-invariant submanifold of a Lorentzian para-Sasakian manifold, *Bull. Malaysian Math. Soc. (2)* **22** (1999), 179–183.
- [4] U.C. DE, A.K. SENGUPTA, CR-submanifolds of a Lorentzian para-Sasakian manifold, *Bull. Malaysian Math. Soc. (2)* **23** (2000), 99–106.
- [5] K. MATSUMOTO, On Lorentzian paracontact manifolds, *Bull. Yamagata Univ. Natur. Sci.* **12** (1998), 151–156.
- [6] K. MATSUMOTO, I. MIHAI, On a certain transformation in a Lorentzian para-Sasakian manifold, *Tensor (N.S.)* **47** (1988), 189–197.
- [7] K. MATSUMOTO, I. MIHAI, R. ROSCA, ξ -null geodesic gradient vector fields on a Lorentzian para-Sasakian manifold, *J. Korean Math. Soc.* **32** (1995), 17–31.
- [8] I. MIHAI, R. ROSCA, On Lorentzian P -Sasakian manifolds, in “Classical Analysis” (Kazimierz Dolny, 1991), World Sci. Publ., River Edge, NJ, 1992, 155–169.
- [9] C. ÖZGÜR, C. MURATHAN, On invariant submanifolds of Lorentzian para-Sasakian manifolds, *Arab. J. Sci. Eng. Sect. A Sci.* **34** (2009), 177–185.

- [10] N. PAPAGHIUC, Semi-invariant submanifolds in a Kenmotsu manifold, *Rend. Mat. (7)* **3** (1983), 607–622.
- [11] A. SARKAR, M. SEN, On invariant submanifolds of LP-Sasakian Manifolds, *Extracta Math.* **27** (2012), 145–154.
- [12] G.J. ZHANG, J.G. WEI, Invariant sub-manifolds and modes of nonlinear autonomous systems, *Appl. Math. Mech.* **19** (1998), 687–693.