

## Almost Contact Metric Submersions and Curvature Tensors

T. TSHIKUNA-MATAMBA

*Département de Mathématiques, Institut Supérieur Pédagogique  
B.P. 282-Kananga, République Démocratique du Congo  
e-mail: tshikmat@yahoo.fr*

(Presented by Marcelo Epstein)

AMS Subject Class. (2000): 53C15, 53C25

Received October 2, 2004

### ABSTRACT

It is known that L. Vanhecke, among others geometers, has studied curvature properties both on almost Hermitian and almost contact metric manifolds.

The purpose of this paper is to interrelate these properties within the theory of almost contact metric submersions. So, we examine the following problem: *Let  $f : M \rightarrow B$  be an almost contact metric submersion. Suppose that the total space is a  $C(\alpha)$ -manifold. What curvature properties do have the fibres or the base space?*

### REFERENCES

- [B1] BLAIR, D.E., “Contact Manifolds in Riemannian Geometry”, Lecture Notes in Math. 509, Springer, New Yoek, 1976.
- [B2] BLAIR, D.E., “Riemannian Geometry of Contact and Symplectic Manifolds”, Progress in Mathematics 203, Birkhäuser, Boston, 2001.
- [C1] CHINEA, D., Quasi-K-cosymplectic submersions, *Rend. Circ. Mat. Palermo* **33** (1984), 319–330.
- [C2] CHINEA, D., Almost contact metric submersions, *Rend. Circ. Mat. Palermo* **34** (1985), 89–104.
- [G] GRAY, A., Curvature identities for Hermitian and almost Hermitian manifolds, *Tohoku Math. J.* **28** (1976), 601–612.

---

Key words: almost contact metric submersions, almost contact metric manifolds, curvature tensors.

- [J-V] JANSSENS, D., VANHECKE, L., Almost contact structures and curvature tensors, *Kodai Math. J.* **4** (1981), 1–27.
- [O’N] O’NEILL, B., The fundamental equations of a submersion, *Michigan Math. J.* **13** (1966), 459–469.
- [T-M1] TSHIKUNA-MATAMBA, T., Quelques classes des submersions métriques presque de contact, *Rev. Roumaine Math. Pures Appl.* **35** (1990), 705–721.
- [T-M2] TSHIKUNA-MATAMBA, T., On the structure of the base space and the fibres of an almost contact metric submersion, *Houston J. Math.* **23** (1997), 291–305.
- [W] WATSON, B., The differential geometry of two types of almost contact metric submersions, in “The Mathematical Heritage of C.F. Gauss”, World Sci. Publishing, River Edge, NJ, 1991, 827–861.
- [W-V1] WATSON, B., VANHECKE, L.,  $K_i$ -curvatures and almost Hermitian submersions, *Rend. Sem. Mat. Univ. Politec. Torino* **36** (1977/78), 205–224.
- [W-V2] WATSON, B., VANHECKE, L., J-symmetries and J-linearities of the configuration tensors of an almost Hermitian submersion, *Simon Stevin* **51** (1977/78), 139–156.