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ON TRANSVERSAL HYPERSURFACES OF AN ALMOST CONTACT MANIFOLD

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§ 0. Introduction.

Hypersurfaces of an almost contact manifold have been studied by Blair [2], [3], Eum [4], Goldberg [5], Ki [11], [12], Ludden [2], [3], Okumura [7], [13], Yamaguchi [10], Yano [3], [5], [11], [12], [13], and others.

Blair [3], Ludden [3], Okumura [13] and Yano [3], [13] found that a hypersurface of an almost contact manifold admits what they call an (f, U, V, u, v, λ)-structure.

Goldberg and one of the present authors [5] called a noninvariant hypersurface of an almost contact manifold a hypersurface such that the transform of a tangent vector of the hypersurface by the tensor φ defining the almost contact structure is never tangent to the hypersurface.

In the present paper, we study what we call transversal hypersurfaces, that is, hypersurfaces which never contain the vector field ξ defining the almost contact structure.

In § 1 we first of all show that a transversal hypersurface of an almost contact manifold admits an almost complex structure F and that a transversal hypersurface of an almost contact metric manifold admits an almost Hermitian structure (F, γ). We also derive a formula which gives the relation between the connection with respect to the Hermitian metric γ and that with respect to the induced Riemannian metric g.

In § 2, we study transversal hypersurfaces of a cosymplectic manifold. In this case the almost Hermitian structure (F, γ) is Kählerian [5].

In § 3, we study transversal hypersurfaces of a Sasakian manifold. In this case also, the almost Hermitian structure (F, γ) is Kählerian.

The last § 4 is devoted to the study of transversal hypersurfaces of a Sasakian manifold of constant curvature.

§ 1. Transversal hypersurface of an almost contact manifold.

Let $\tilde{M}$ be a $(2n+1)$-dimensional differentiable manifold covered by a system

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