ON SOME PROPERTIES OF HYPERSURFACES WITH CERTAIN CONTACT STRUCTURES

By

Tamao NAGAI and Hidemaro KÔJYÔ

§1. Introduction. Let E^{2n+2} be a $(2n+2)$-dimensional Euclidean space with cartesian coordinates. We put

$$F=(F_j^i)=\begin{pmatrix}0 & E_m\\ -E_m & 0\end{pmatrix},\quad g=(g_{ij})=\begin{pmatrix}E_m & 0\\ 0 & E_m\end{pmatrix},$$

where E_m $(m=n+1)$ is the unit matrix of dimension m. Then F is an almost complex structure in E^{2n+2} and the Euclidean metric g is a Hermitian metric with respect to the almost complex structure. Therefore we may consider E^{2n+2} as an almost Hermitian space. S. Sasaki and Y. Hatakeyama [5][1] showed that a hypersphere imbedded in E^{2n+2} is an example of a manifold admitting a normal contact metric structure. On the other hand, Y. Tashiro [7] proved that an orientable hypersurface in an almost complex space has an almost contact structure. These results gave us the problem to study the geometric properties of hypersurfaces in almost complex spaces.

In an almost complex space there always exists an affine connection, called F-connection, transposing the almost complex structure F parallely. Suitable restrictions for F-connection characterize the special class of almost complex space. In the paper [7], properties of hypersurfaces in almost complex spaces were discussed by making use of the relations between F-connection and its induced one. Concerning a Kählerian space Y. Tashiro [7] gave the geometric meaning of the condition in order that a hypersurface has a normal contact structure.

In an almost complex space there exists a Riemannian metric g and without loss of generality we may assume that g be an almost Hermitian metric [8]. The Kählerian space is characterized by that the Riemannian connection defined by g is an F-connection. In general, the Riemannian connection is not an F-connection and restrictions for covariant derivatives of F characterize the special class of an almost Hermitian space. In this paper we always assume that the treated almost complex structure is Hermitian and we shall use the

1) Numbers in brackets refer to the references at the end of the paper.