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CERTAIN CHARACTERIZATIONS OF REAL HYPERSURFACES OF TYPE A IN A COMPLEX SPACE FORM

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§ 1. Introduction

A complex n-dimensional Kähler manifold of constant holomorphic sectional curvature c is called a *complex space form*, which is denoted by $M_n(c)$. A complete and simply connected complex space form consists of a complex projective space P_nC, a complex Euclidean space C^n or a complex hyperbolic space H_nC, according as $c > 0$, $c = 0$ or $c < 0$.

In this paper, we consider a real hypersurface M in $M_n(c)$. Typical examples of M in P_nC are the six model spaces of type A_1, A_2, B, C, D and E (cf. [10]), and the ones of M in H_nC are the four model spaces of type A_0, A_1, A_2 and B (cf. [1]), which are all given as orbits under certain Lie subgroups of the group consisting of all isometries of P_nC or H_nC. Denote by (ϕ, ξ, η, g) the *almost contact metric structure* of M induced from the almost complex structure of $M_n(c)$ and A the shape operator of M. Eigenvalues and einvectors of A are called *principal curvatures and principal vectors*, respectively.

Many differential geometers have studied M from various points of view. In particular, Berndt [1] and Takagi [10] investigated the homogeneity of M. According to Takagi's classification theorem and Berndt's one, the principal curvatures and their multiplicities of homogeneous real hypersurfaces in $M_n(c)$ are given. Moreover, it is very interesting to characterize homogeneous real hypersurfaces of $M_n(c)$. There are many characterizations of homogeneous ones of type A since these examples have a lot of beautiful geometric properties, where *type A* means type A_1 or A_2 in P_nC and type A_0, A_1 or A_2 in H_nC. Okumura [8] and Montiel-Romero [7] proved the fact in P_nC and H_nC, respectively that M

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