Nihonkai Math. J.
Vol.8 (1997), 155-170

CERTAIN REAL HYPERSURFACES OF A COMPLEX SPACE FORM II

HYANG SOOK KIM
YONG SOO PHO

0. Introduction

We denote by $M_n(c)$ a complete and simply connected complex n-dimensional Kählerian manifold of constant holomorphic sectional curvature $4c$, which is called a *complex space form.* Such an $M_n(c)$ is biholomorphically isometric to a complex projective space $P_n\mathbb{C}$, a complex Euclidean space $\mathbb{C}^n$ or a complex hyperbolic space $H_n\mathbb{C}$, 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 $P_n\mathbb{C}$ are the six model spaces of type A_1, A_2, B, C, D and E (cf. Theorem A in §1), and the ones of M in $H_n\mathbb{C}$ are the four model spaces of type A_0, A_1, A_2 and B (cf. Theorem B in §1), which are all given as orbits under certain Lie subgroups of the group consisting of all isometries of $P_n\mathbb{C}$ or $H_n\mathbb{C}$. Denote by (ϕ, ξ, η, g) the *almost contact metric structure* of M induced from the almost complex structure of $M_n(c)$, by A the shape operator and by S the Ricci tensor of M. Many differential geometers have studied M from various points of view. For example, Berndt [1] and Takagi [13] investigated the homogeneity of M. Kimura [6] proved that if all principal curvatures of M in $P_n\mathbb{C}$ are constant and ξ is principal vector of A, then M is congruent to one of model spaces. Moreover, Yano and Kon [15] studied M in $P_n\mathbb{C}$ satisfying the condition $A\phi + \phi A = k\phi$ for a constant $k \neq 0$ and Ki and Suh [3]

Key words and phrases. complex space form, shape operator, principal structure vector, Ricci tensor.

This paper was partially supported by YAKSOO Research Foundation