Nihonkai Math. J.
Vol.6 (1995), 97-114

CHARACTERIZATIONS OF CERTAIN REAL HYPERSURFACES OF A COMPLEX SPACE FORM

YEONG-WU CHOE

0. Introduction

Let $M_n(c)$ be an n-dimensional complex space form with constant holomorphic sectional curvature c. It is well known that 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 of P_nC or H_nC. The real hypersurface M has an almost contact metric structure (ϕ, ξ, η, g) induced from the complex structure J of $M_n(c)$.

The study of real hypersurfaces of P_nC was initiated again by Takagi[14], who proved that all homogeneous real hypersurfaces of P_nC could be divided into the six model spaces (cf. the case $c > 0$ of Theorem A). Recently, Kimura and Maeda[7] characterized a geodesic hypersphere M in P_nC in terms of the derivative of the Ricci tensor S. Moreover, they investigated real hypersurfaces M in terms of curvature operator $R(X, Y)$ of M on the Ricci tensor S and the shape operator A.

On the other hand, real hypersurfaces of H_nC have also been investigated by Berndt[1], Montiel[10], Montiel and Romero[11], etc. In particular, by using the notions of the tube in Cecil and Ryan[2], Montiel[10], also classified the real hypersurfaces of H_nC with at most two distinct principal curvatures. Recently, Berndt[1] classified all real hypersurfaces with constant principal curvatures of H_nC (cf. the case $c < 0$ of Theorem A).

The main purpose of this paper is to give characterizations of real hypersurfaces of type A_0, A_1 and A_2 of H_nC, and to compare the real hypersurfaces of H_nC with those of P_nC under the same conditions. In

The author was partially supported by Ministry of Education, Korea