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ON RULED REAL HYPERSURFACES IN A COMPLEX SPACE FORM

Dedicated to Professor Hisao NAKAGAWA on his sixtieth birthday

By

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§ 0. Introduction.

A complex n-dimensional Kaehlerian 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 $c<0$. The induced almost contact metric structure of a real hypersurface M of $M_n(c)$ is denoted by (ϕ, ξ, η, g).

In his study of real hypersurfaces of a complex projective space P_nC, Takagi [10] classified all homogeneous real hypersurfaces and Cecil-Ryan [2] showed also that they are realized as the tubes of constant radius over Kaehlerian submanifolds if the structure vector field ξ is principal. On the other hand, real hypersurfaces of a complex hyperbolic space H_nC also investigated by Berndt [1], Montiel [7], Montiel and Romero [8] and so on. Berndt [1] classified all homogeneous real hypersurfaces of H_nC and showed that they are realized as the tubes of constant radius over certain submanifolds. According to Takagi's classification theorem and Berndt's one the principal curvatures and their multiplicities of homogeneous real hypersurfaces of $M_n(c)$ are all determined.

In particular, Maeda [6] and Okumura [9] (resp. Montiel [7] and Montiel-Romero [8]) considered real hypersurfaces of $M_n(c)$, $c>0$ (resp. $c<0$) whose second fundamental tensor A of M in $M_n(c)$, $c\neq 0$, satisfies

$$(0.1)\qquad (\nabla_X A)Y=\frac{c}{4}\{\eta(X)\phi Y-g(\phi X, Y)\xi\},$$

$$(0.2)\qquad A\phi-\phi A=0.$$

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