

On Kaehlerian Slant Submanifolds in Complex Space Forms Satisfying a Geometrical Equality

Ion MIHAI *

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Abstract - B.-Y. Chen established a sharp relationship between the Ricci curvature and the squared mean curvature for a Lagrangian submanifold in a complex space form and investigated the equality case.

K. Matsumoto, Y. Tazawa and the present author obtained a sharp estimate of the Ricci tensor of a slant submanifold M in a complex space form, in terms of the main extrinsic invariant, namely the squared mean curvature. If, in particular, M is a Kaehlerian slant submanifold which satisfies the equality case identically, then it is minimal.

In the present paper, we give new and elegant proofs of the above results. In addition, obstructions to the equality case are obtained.

Key words and phrases : Ricci curvature, mean curvature, complex space form, Kaehlerian slant submanifold, Chen invariants

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1 Preliminaries

Let M be an n -dimensional submanifold of an m -dimensional complex space form $\widetilde{M}(4c)$ of constant holomorphic sectional curvature $4c$. We denote by ∇ and $\widetilde{\nabla}$ the Levi-Civita connections of M and $\widetilde{M}(4c)$, respectively. Let J be the complex structure on $\widetilde{M}(4c)$. Also, we denote by h the second fundamental form and R the Riemann curvature tensor of M .

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