CR submanifolds of maximal CR dimension in Kähler manifolds

Mirjana Djorić

University of Belgrade, Faculty of Mathematics, Studentski trg 16, pb. 550, 11000 Belgrade, Serbia
[mdjoric@matf.bg.ac.rs]

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We study real n-dimensional submanifolds M of a Kähler manifold $\tilde{M}^{n+p}$ such that the holomorphic tangent subspace has dimension $(n-1)$ at each point (CR submanifolds of maximal CR dimension in brief) and we investigate the differential geometric properties of these manifolds. Then there exists a unit vector field ξ normal to M such that $JT_x(M) \subset T_x(M) \oplus span\{\xi_x\}$, for any $x \in M$, where J is the almost complex structure of $\tilde{M}$.

Treating CR submanifolds of maximal CR dimension in complex space forms, we establish a few characteristics of the shape operator with respect to the distinguished vector field ξ and we give one characterization of the CR submanifold in this particular case.

Moreover, since there are two geometric structures: an almost contact structure F, induced from the complex structure J of the ambient space $\tilde{M}$, and a submanifold structure, represented by the second fundamental tensor h of M in $\tilde{M}$, it is interesting to study certain conditions on the almost contact structure F and on the second fundamental tensor h of these manifolds. We obtain new characterizations of some remarkable families of submanifolds (model spaces) when the ambient space is a complex space form.

This talk is based on joint research with M. Okumura.