RIEMANNIAN FOLIATIONS OF HERMITIAN SYMMETRIC SPACES WITH COMPLEX LEAVES

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Due to work of Nagy [6] it is known that singular Riemannian foliations of compact Kähler manifolds are extremely rigid. We obtain classification results for Hermitian symmetric spaces. We show that the only regular Riemannian foliation of complex projective space with complex leaves is given by the leaves of the twistor fibration $\pi : \mathbb{C}P^{2n+1} \to \mathbb{H}P^n$. We strengthen this theorem to a local statement for foliations of projective space by complex hypersurfaces, and investigate the situation for general Hermitian symmetric spaces. Finally we answer a question of Alfred Gray [1]: when do the tubes around a complex submanifold of projective space form a singular Riemannian foliation?

References

[1] Gray, A. *The minimal focal distance of a complex hypersurface in complex projective space*, Conference on Differential Geometry and Topology(Lecce, 1989). Note Mat. 9 (1989), suppl., 119-122.

[2] Gray, A. *Volumes of tubes about complex submanifolds of complex projective space*, Trans. Amer. Math. Soc. 291 (1985), no. 2, 437-449.

[3] Gray, A. *Volumes of tubes about Kähler submanifolds expressed in terms of Chern classes*, J. Math. Soc. Japan 36 (1984), no. 1, 23-35.

[4] Murphy, T. *Riemannian foliations of projective space with complex leaves*, preprint.

[5] Murphy, T. *Curvature-adapted submanifolds of symmetric spaces*, Indiana U. Math. J., to appear.

[6] Nagy, P.A. *Rigidity of Riemannian foliations with complex leaves on Khler manifolds*, J. Geom. Anal. 13 (2003), no. 4, 659667.