

Differentiable manifolds admitting complex distributions

By

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The present paper continues the study made in a recent series of papers [2] and [3]¹⁾, concerning with an analytic n -dimensional manifold admitting a complex r -dimensional distribution satisfying a certain condition. For brevity, such a structure of a manifold will be called a π' -structure. In the first paper [2], the case where $n=2r+1$ was treated and some results were obtained in connection with an almost contact metric structure due to S. Sasaki. In the second paper [3] was presented a generalisation of these results to the case where $n\geq 2r$ and it was found that there is a close relation between a π' -structure and an f -structure due to K. Yano.

The purpose of the present paper is to show an existence of a certain f -structure and a symmetric real affine connection on a manifold with a $(\pi'-\Gamma)$ -structure such that f is covariant constant. To do this, we shall first make clear a more precise relation between a π' -structure and an f -structure, and discuss an integrable π' -structure. We shall express our main result in Theorem 9. It is remarked here that we assumed, in preceding papers, the manifold under consideration to be analytic, and, however, we shall treat, in the following, manifolds of class C^∞ , unless otherwise provided.

1) Numbers in brackets refer to the references at the end of the paper.