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Pseudoconnections on an almost complex manifold. (English) [Zbl 0806.53031](#)

Szente, J. (ed.) et al., Differential geometry and its applications. Proceedings of a colloquium, held in Eger, Hungary, August 20-25, 1989, organized by the János Bolyai Mathematical Society. Amsterdam: North-Holland Publishing Company. Colloq. Math. Soc. János Bolyai. 56, 447-456 (1992).

Let (M, J) be an almost complex manifold and (∇, A) a linear pseudoconnection on M , where A is a tensor field of type $(1,1)$. The existence of a torsion-free almost complex pseudoconnection on M has been characterized by other authors. In this paper, the author gives an outline of an alternative proof of the same result. He constructs a tensor field L_A^J depending on A and J such that $L_A^J = 0$ is a necessary and sufficient condition for the existence of a torsion-free almost complex pseudoconnection (∇, A) . He gives also some special examples. Furthermore, he considers a hermitian metric on (M, J) and the Levi-Civita pseudoconnection (∇, A) . He proves that if $L_A^J = 0$ holds, then (∇, A) is almost complex if and only if $d_A\Phi = 0$, where Φ is the fundamental 2-form on (M, J, g) . Finally, the author defines a twisted Kähler manifold as a quadruple (M, J, g, A) with $L_A^J = 0$ and $d_A\Phi = 0$, and he gives examples of such manifolds.

For the entire collection see [\[Zbl 0764.00002\]](#).

Reviewer: [A.M.Pastore \(Bari\)](#)

MSC:

- [53C15](#) General geometric structures on manifolds (almost complex, almost product structures, etc.)
- [53C05](#) Connections (general theory)
- [53C55](#) Global differential geometry of Hermitian and Kählerian manifolds

Keywords:

[almost complex manifold](#); [pseudoconnection](#); [hermitian metric](#); [twisted Kähler manifold](#)