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Hermitian-Yang-Mills connection on non-Kähler manifolds. (English) Zbl 0664.53011

Mathematical aspects of string theory, Proc. Conf., San Diego/Calif. 1986, Adv. Ser. Math. Phys. 1, 560-573 (1987).

[For the entire collection see Zbl 0651.00012.]

The theorem of Donaldson and Uhlenbeck-Yau relating Hermitian-Yang-Mills connections to stable holomorphic bundles [S. K. Donaldson, Duke Math. J. 54, 231-247 (1987; Zbl 0627.53052); *K. Uhlenbeck* and *S. T. Yau*, Commun. Pure. Appl. Math. 39, S 257-S 293 (1986; Zbl 0615.58045)] is suspectible to generalizations in various directions. One needs on the one hand a gauge-theoretic differential equation of Yang-Mills type and on the other an algebro-geometric notion of stability. In this paper, the authors refine their original method to cover the case of non-Kähler Hermitian complex manifolds. The 2-dimensional case of this result, proved by a "direct" method was in fact done independently by *N. P. Buchdahl* [Math. Ann. 280, 625-648 (1988; Zbl 0617.32044)] and has already been used by Braam and Hurtubise to study instantons on Hopf surfaces. The authors have in mind a motivation arising from the demands of physicists studying string theory.

Reviewer: N.Hitchin

MSC:

53C05	Connections, general theory
32L05	Holomorphic bundles and generalizations
35Q99	Partial differential equations of mathematical physics and other areas of application
81T08	Constructive quantum field theory

Keywords:

Hermitian-Yang-Mills connections; stable holomorphic bundles; non- Kähler Hermitian complex manifolds; instantons; string theory