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Some examples of vector bundles on the flag variety $\mathbb{F}(1,2)$. (English) Zbl 0559.14007

Algebraic geometry, Proc. int. Conf., Bucharest/Rom. 1982, Lect. Notes Math. 1056, 187-254 (1984).

[For the entire collection see Zbl 0527.00002.]

The Penrose transform relating holomorphic vector bundles on $\mathbb{C}P^3$ with solutions to the self-dual Yang-Mills equations brought algebraic geometers, differential geometers and physicists together to produce methods of classification and construction of stable holomorphic bundles on projective spaces. The construction which in the end was most useful is related to the monads of Horrocks and Barth. The paper under review replaces $\mathbb{C}P^3$ by the flag variety $\mathbb{F}(1,2)$ which fits into the same scheme but which, until recently, has been largely ignored. The main emphasis of the paper is the algebraic geometry of stable bundles and various construction methods. In particular, the notion of jumping lines and splitting type is discussed as are the moduli spaces of the stable bundles, with a sideways glance at the corresponding instanton problem on $\mathbb{C}P^2$. In fact, *N. P. Buchdahl* [to appear] has carried out the monad programme analogous to the ADHM construction of instantons in this case, as has *S. K. Donaldson* [to appear] in a particular case. This paper is, however, aimed at algebraic geometers and overlaps little with the above works.

Reviewer: N.J.Hitchin

MSC:

14F05 Sheaves, derived categories of sheaves, etc. (MSC2010)
32L05 Holomorphic bundles and generalizations
14M15 Grassmannians, Schubert varieties, flag manifolds

Cited in **1** Document

Keywords:

Penrose transform; self-dual Yang-Mills equations; stable holomorphic bundles on projective spaces; monads; flag variety; jumping lines; splitting type; moduli spaces of the stable bundles

Edited by FIZ Karlsruhe, the European Mathematical Society and the Heidelberg Academy of Sciences and Humanities
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