

Wiśniewski, Jarosław A.

Uniform vector bundles on Fano manifolds and an algebraic proof of Hwang-Mok characterization of Grassmannians. (English) [Zbl 1054.14056](#)

Bauer, Ingrid (ed.) et al., Complex geometry. Collection of papers dedicated to Hans Grauert on the occasion of his 70th birthday. Berlin: Springer (ISBN 3-540-43259-0/hbk). 329-340 (2002).

The author conjectures that a Fano manifold X is homogeneous if the tangent bundle TX is uniform w.r.t. some dominating unsplit family of rational curves (see the paper for the definition). He tests it successfully on the known cases: Characterization of projective spaces by *S. Mori* [Ann. Math. 110, 593–606 (1979; [Zbl 0423.14006](#))]; characterization of hyperquadrics by Cho-Sato, Y. Ye, Hwang-Mok and Wierzba; Grassmann manifolds and isotropic Grassmann manifolds by Hwang and Mok. The key new ideas are: (1) a characterization of twisted trivial vector bundles by *M. Andreatta* and the author [Invent. Math. 146, 209-217 (2001; [Zbl 1081.14060](#))], and (2) the Atiyah extension of the short exact sequence with the cotangent bundle on the left and the structure sheaf on the right. The new proofs of old theorems look very elegant.

For the entire collection see [\[Zbl 0989.00069\]](#).

Reviewer: [De-Qi Zhang \(Singapore\)](#)

MSC:

- [14J45](#) Fano varieties
- [14M15](#) Grassmannians, Schubert varieties, flag manifolds
- [14J60](#) Vector bundles on surfaces and higher-dimensional varieties, and their moduli

Cited in **2** Documents

Keywords:

[homogeneous Fano manifold](#); [hyperquadrics](#); [isotropic Grassmann manifolds](#)