



Mathematics > Algebraic Geometry

Vector bundles of rank four and $A_3 = D_3$

Asher Auel

(Submitted on 13 Jul 2011 (v1), last revised 20 Jul 2012 (this version, v2))

Over a scheme with 2 invertible, we show that a vector bundle of rank four has a sub or quotient line bundle if and only if the canonical symmetric bilinear form on its exterior square has a lagrangian subspace. For this, we exploit a version of "Pascal's rule" for vector bundles that provides an explicit isomorphism between the moduli functors represented by projective homogeneous bundles for reductive group schemes of type A_3 and D_3 . Under additional hypotheses on the scheme (e.g. proper over a field), we show that the existence of sub or quotient line bundles of a rank four vector bundle is equivalent to the vanishing of its Witt-theoretic Euler class.

Comments: 16 pages, final version; IMRN 2012 rns140
 Subjects: **Algebraic Geometry (math.AG)**; Number Theory (math.NT)
 MSC classes: 14L35, 11E57, 19G12, 14D20, 11E81, 14L15
 DOI: [10.1093/imrn/rns140](https://doi.org/10.1093/imrn/rns140)
 Cite as: [arXiv:1107.2466](https://arxiv.org/abs/1107.2466) [math.AG]
 (or [arXiv:1107.2466v2](https://arxiv.org/abs/1107.2466v2) [math.AG] for this version)

Submission history

From: Asher Auel [[view email](#)]
[\[v1\]](#) Wed, 13 Jul 2011 05:39:19 GMT (21kb)
[\[v2\]](#) Fri, 20 Jul 2012 19:59:36 GMT (23kb)

[Which authors of this paper are endorsers?](#)

Link back to: [arXiv](#), [form interface](#), [contact](#).

Download:

- [PDF](#)
- [PostScript](#)
- [Other formats](#)

Current browse context:

math.AG

[< prev](#) | [next >](#)

[new](#) | [recent](#) | [1107](#)

Change to browse by:

[math](#)
[math.NT](#)

References & Citations

- [NASA ADS](#)

Bookmark (what is this?)

