

Constructing axial algebras

Justin McInroy

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Abstract

If an axial algebra has graded fusion rules, then there is a natural subgroup $G(X)$ of the automorphism group of A which is generated by the involutions associated to the axes X . This is called the *pure group*, or the *Miyamoto group*. Conversely, we could ask the following important question:

Problem. *Given a group G , can we find the axial algebras whose pure group is G ?*

This was first considered by Seress for a restricted class of axial algebras (those which are 2-closed with the Monster fusion rules, a Frobenius form and satisfying some additional conditions). We present a new algorithm to construct a general axial algebra A with \mathbb{Z}_2 -graded fusion rules, so removing all of the previous restrictions. We give some of the results obtained and also discuss some future improvements.

This is joint work with Sergey Shpectorov.