

1067-16-1325

**Anne Quéguiner-Mathieu\*** (queguin@math.univ-paris13.fr) and **Jean-Pierre Tignol**.

*Triality and Arason invariant for algebras with involution.* Preliminary report.

Among Dynkin diagrams, the diagram of type  $D_4$  is specific in that it admits automorphisms of order 3. The corresponding simply connected algebraic group is the cover  $Spin_8$  of the special orthogonal group. Twisted forms of this group can also be viewed as the Spin group of some algebraic structure, namely an 8-dimensional quadratic form, or even, more generally, a degree-8 algebra with orthogonal involution. Because of triality, those degree-8 algebras with involution actually come by triple.

This fact can be used to understand invariants of degree-8 algebras with involution. By way of example, we will explain how to extend the Arason invariant of quadratic forms to involutions. If the underlying algebra is division, it is already known that there is no such invariant. Nevertheless, triality enable us to define a *relative* Arason invariant, which can be described as the Arason invariant of some quadratic form associated to any pair of orthogonal involutions. This invariant detects hyperbolic involutions. But, as opposed to what happens in quadratic form theory, it does not detect isomorphic involutions. In fact, it vanishes when the two involutions are isomorphic over any splitting field of the algebra, which does not imply they are isomorphic. (Received September 20, 2010)