1084-14-61 **Asher Auel** and **Marcello Bernardara*** (mbernard@math.univ-toulouse.fr), Université P.Sabatier, Institut de Math. de Toulouse, 118 route de Narbonne, 31062 Toulouse, France, and **Michele Bolognesi** and **Anthony Várilly-Alvarado**. *Rational cubic fourfolds containing a plane with nontrivial Clifford invariant.* Preliminary report.

A very challenging question is to determine whether a smooth projective cubic fourfold X is rational or not, and to establish rationality criteria. For example no cubic fourfold is known to be not rational. It is known that X is rational either if X is Pfaffian or if X contains a plane and the associated quadric fibration admits a section.

Kuznetsov proposed the following conjecture: X is rational if and only if a distinguished subacategory $\mathbb{A}$ of the derived category $D(X)$ is equivalent to the derived category of a K3 surface. The conjecture holds true in the two previous cases.

If X contains a plane, one can associate to X a quadric fibration over $\mathbb{P}^2$, and a degree 2 K3 surface S. This determines an Azumaya algebra β on S, the Clifford invariant of X. The quadric fibration admits a section if and only if β is trivial. Kuznetsov establishes an equivalence between $\mathbb{A}$ and $D(S, \beta)$, proving the conjecture.

In this paper, we provide an example of a Pfaffian (hence rational and realizing Kuznetsov conjecture) X with nontrivial Clifford invariant. Moreover, we establish Hodge theoretic cirteria for a cubic fourfold containing a plane whose group of algebraic cycles of codimension 2 has rank 3 to have (non)trivial Clifford invariant. (Received August 16, 2012)