1043-14-52 **Adrien Dubouloz*** (adrien.dubouloz@u-bourgogne.fr), Institut de Mathématiques de Bourgogne, 9 avenue Alain Savary - BP 47870, 21078 DIJON, France. *The Cancellation Problem for the Koras-Russell cubic threefold.* Preliminary report.

The Koras-Russell cubic threefold is the algebraic subvariety X of the complex affine space $\mathbb{C}^4$ defined by the equation $x + x^2y + z^2 + t^3 = 0$. It is known that X is isomorphic to $\mathbb{R}^6$ when equipped with the euclidean topology. In contrast, Makar-Limanov established in 1996 that it is not algebraically isomorphic to the complex affine space $\mathbb{C}^3$, because it admits fewer algebraic actions of the additive group $(\mathbb{C}, +)$. Nowadays, it is still an open question whether the cylinder $X \times \mathbb{C}$ over X is algebraically isomorphic to the affine space $\mathbb{C}^4$.

Certainly, one possible way to solve the problem would be to show that X satisfies Zariski Cancellation, i.e., that every variety Y such that $Y \times \mathbb{C}$ is isomorphic to $X \times \mathbb{C}$ is isomorphic to X itself. Indeed, if so then $X \times \mathbb{C}$ cannot be isomorphic to $\mathbb{C}^4 \simeq \mathbb{C}^3 \times \mathbb{C}$ as X is not isomorphic to $\mathbb{C}^3$. In this talk, we will discuss a general method to construct potential counter-examples to the Cancellation Problem for the Koras-Russell cubic threefold. As a by-product, we will derive the fact that the Makar-Limanov invariant of $X \times \mathbb{C}$ is trivial. (Received August 11, 2008)