UNIPOTENT GROUP STRUCTURES ON QUINTIC DEL PEZZO VARIETIES

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ABSTRACT. del Pezzo varieties arise as a natural higher-dimensional generalization of the classical del Pezzo surfaces. Over the complex numbers, they were extensively studied by T. Fujita in the 1980s, who classified them according to their degree. In degree 5, it follows from Fujita's classification that all of these manifolds are obtained as linear sections of the 6-dimensional Grassmannian $\mathrm{Gr}(2,5)$ with respect to the Plücker embedding, whose points parametrize 2-dimensional linear subspaces of a vector space of dimension 5.

In this talk, we will discuss the existence and uniqueness of $\mathbf{G}_a^n$-structures on these varieties, i.e., we will determine when and in how many ways one can obtain them as equivariant compactifications of the abelian unipotent group $\mathbf{G}_a^n$. To do so, we study the Hilbert schemes of certain linear subspaces on such varieties and we analyze some explicit equivariant Sarkisov links. As an application, we give some new results on k-forms of quintic del Pezzo varieties over an arbitrary field k of characteristic zero.

Joint work with ADRIEN DUBOULOZ (Dijon) and TAKASHI KISHIMOTO (Saitama).

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