

Finiteness results for real structures on rational surfaces

A real structure on a complex projective variety X is an antiregular (or antiholomorphic) involution. The data of such a structure on X is equivalent to the data of a real variety whose complexification is isomorphic to X (i.e. a real form of X). The aim of this talk is to show how the study of automorphism groups of rational surfaces can be used in order to give a partial answer to the question : does every rational surface have finitely many real forms (up to isomorphism)? On the one hand, we show that every rational surface whose automorphism group does not contain a nonabelian free group has finitely many real forms. On the other hand, we will show that there exist rational surfaces with large automorphism groups which also have finitely many real forms, like unnodal Coble surfaces studied by Cantat and Dolgachev, or KLT Calabi-Yau pairs.

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