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# ELEMENTS GENERATING A PROPER NORMAL SUBGROUP IN THE CREMONA GROUP

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**Key words :** Birational geometry, small cancellation, hyperbolic spaces.

**Abstract:** A birational transformation of the projective plane is an isomorphism between two dense open subsets of the projective plane. We are interested in the Cremona group, namely the group of birational transformations of the projective plane.

A key tool to study this group is its action on a infinite dimensional hyperbolic space. Using this action, S. Lamy and S. Cantat answered positively, when the field is algebraically closed, the following long standing open question: Is the Cremona group simple?

During my phd, I extended this result to any field by finding an element satisfying the WPD (weakly properly discontinous) property. This implies by a work of F. Dahmani, V. Guirardel and D. Osin that the normal subgroup generated by a power of this element is a proper subgroup of the Cremona group. The question is then, which kind of elements generates a proper normal subgroup of the Cremona group? We answered this question in a work in collaboration with S. Cantat and V. Guirardel.