Bulletin

de la SOCIÉTÉ MATHÉMATIQUE DE FRANCE

Tome 150
Fascicule 4

2022

SOCIÉTÉ MATHÉMATIQUE DE FRANCE

Pages 625-796

Bull. Soc. Math. France
150 (4), 2022, p. 625-796

Sommaire

Bull. Soc. Math. France
150 (4), 2022, p. 625-796

Contents

Bull. Soc. Math. France
150 (4), 2022, p. 625-676

ON THE CLASSIFICATION OF CUBIC PLANAR CREMONA MAPS

by Alberto Calabri & Nguyen Thi Ngoc Giao

Abstract. — We give a fine and complete classification of cubic planar Cremona maps, up to automorphisms of the plane. For this purpose, we introduce a new discrete invariant for cubic planar Cremona maps, called enriched weighted proximity graph, which encodes some properties of the base locus of the Cremona map.

Résumé (*Sur la classification des transformations cubiques planes de Cremona*). — Nous donnons une classification complète et fine des transformations cubiques planes de Cremona, modulo l'action des automorphismes du plan. Dans ce but, nous introduisons un nouvel invariant discret pour les transformations cubiques planes de Cremona, appelé graphe de proximité pondéré enrichi, qui décrit certaines propriétés du lieu de base de la transformation de Cremona.

1. Introduction

We work over the field $\mathbb{C}$ of complex numbers. We denote by $\mathbb{P}^2$ the projective plane and by $\mathrm{Bir}(\mathbb{P}^2)$ the *plane Cremona group*, that is, the group of birational maps $\mathbb{P}^2 \dashrightarrow \mathbb{P}^2$. Generators of $\mathrm{Bir}(\mathbb{P}^2)$ are very well known, for over a century, thanks to the classical works of Noether and Castelnuovo, namely

Texte reçu le 22 août 2020, modifié le 1er juillet 2022, accepté le 26 septembre 2022.

Alberto Calabri, Dipartimento di Matematica e Informatica, Università degli Studi di Ferrara, Via Machiavelli 30, 44121 Ferrara, Italy • *E-mail :* alberto.calabri@unife.it
Nguyen Thi Ngoc Giao, Faculty of Advanced Science and Technology, University of Science and Technology – The University of Da Nang, 54 Nguyen Luong Bang, Da Nang, Vietnam • *E-mail :* ngocgiao185@gmail.com

Mathematical subject classification (2010). — 14E05, 14E07.

Key words and phrases. — Cubic maps, base points, proximity graph.

0037-9484/2022/625/$ 5.00
doi:10.24033/bsmf.2857