

OVERDETERMINED SYSTEMS OF LACUNARY POLYNOMIAL EQUATIONS

FRANCESCO AMOROSO, LOUIS LEROUX, AND MARTÍN SOMBRA

ABSTRACT. Based on recent work by Filaseta, Granville and Schinzel, we show that the gcd of two lacunary polynomials can be computed in time quasi-linear in the logarithm of their degree. This algorithm relies on an effective version of a result of Bombieri, Masser and Zannier on multiplicatively dependent points in algebraic varieties.

We also present the following extension to the higher dimensional case: a system of $s \geq n + 1$ lacunary polynomials in n variables can be reduced in time quasi-linear in the logarithm of its degree, to a finite set of systems of n polynomials in n variables. This is a conditional result which depends on an effective version of a conjecture by Zilber, extending the aforementioned result by Bombieri and Zannier.

Amoroso, Leroux: Laboratoire de mathématiques Nicolas Oresme, Université de Caen. Campus II, BP 5186, 14032 Caen Cedex, France

E-mail address: amoroso@math.unicaen.fr, leroux@math.unicaen.fr

Sombra: ICREA & Departament d'Àlgebra i Geometria, Universitat de Barcelona. Gran Via 585, 08007 Barcelona, Spain

E-mail address: sombra@ub.edu