POLAR CREMONA TRANSFORMATIONS AND MONODROMY OF POLYNOMIALS

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Abstract. Consider the gradient map associated to any non-constant homogeneous polynomial $f \in \mathbb{C}[x_0, \dots, x_n]$ of degree d, defined by

$$\phi_f = grad(f) \colon D(f) \to \mathbb{P}^n, (x_0 \colon \dots \colon x_n) \to (f_0(x) \colon \dots \colon f_n(x))$$

where $D(f) = \{x \in \mathbb{P}^n; f(x) \neq 0\}$ is the principal open set associated to f and $f_i = \frac{\partial f}{\partial x_i}$. This map corresponds to polar Cremona transformations. In Proposition 3.4 we give a new lower bound for the degree $d(f)$ of ϕ_f under the assumption that the projective hypersurface $V : f = 0$ has only isolated singularities. When $d(f) = 1$, Theorem 4.2 yields very strong conditions on the singularities of V.

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