SIDE 14.2



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Computing degree growth of birational maps from local indices of polynomials

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Content :

One of the most important dynamical invariant associated to a birational map f is given by its dynamical degree, or equivalently, its algebraic entropy, which is defined via the rate of growth of the sequence $deg(f^n)$. More concretely, the degrees $deg(f^n)$, although not birationally invariant by themselves, are also of great interests in understanding the dynamics of the birational map. We propose a general method for computing the degrees $deg(f^n)$. More precisely, given

a homogeneous polynomial P, we compute the iterated pullbacks of the polynomial by the map f. To do this, we perform a sequence of blowing ups and to each blowing up we associate a local index $\mu(P)$ to a polynomial P. Together with the degrees deg(f^n), these local indices satisfy a recurrence relation which can be solved to obtain the degrees deg(f^n).

In two dimensional cases, we show that these indices are closely related to the intersection numbers. In principle, however, this method is applicable to birational maps in any dimension.

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