Extreme values of the resurgence for homogeneous ideals in polynomial rings.

Summary: We show that two ostensibly different versions of the asymptotic resurgence introduced by E. Guardo, B. Harbourne and A. Van Tuyl in 2013 are the same. We also show that the resurgence and asymptotic resurgence attain their maximal values simultaneously, if at all, which we apply to a conjecture of E. Grifo. For radical ideals of points, we show that the resurgence and asymptotic resurgence attain their minimal values simultaneously. In addition, we introduce an integral closure version of the resurgence and relate it to the other versions of the resurgence. In closing we provide various examples and raise some related questions, and we finish with some remarks about computing the resurgence.

MSC:

14C20 Divisors, linear systems, invertible sheaves
13B22 Integral closure of commutative rings and ideals
13M10 Polynomials and finite commutative rings
14N05 Projective techniques in algebraic geometry
13D40 Hilbert-Samuel and Hilbert-Kunz functions; Poincaré series

Keywords:
resurgence; asymptotic resurgence; symbolic power; integral closure of ideals; fat points; polynomial ring

Full Text: DOI

References:

[11] Denkert, A., Results on containments and resurgences, with a focus on ideals of points in the plane (2013), University of Nebraska-Lincoln, PhD thesis

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