

# Euler characteristic of the bifurcation set for a polynomial of degree 2 or 3

Gleb G. Gusev

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Assume that the coefficients of a polynomial in a complex variable are Laurent polynomials in some complex parameters. The parameter space (a complex torus) splits into strata corresponding to different combinations of coincidence of the roots of the polynomial. For generic Laurent polynomials with fixed Newton polyhedra the Euler characteristics of these strata are also fixed. We provide explicit formulae for the Euler characteristics of the strata in terms of the polyhedra of the Laurent polynomials in the cases of degrees 2 and 3. We also obtain some corollaries in combinatorial geometry, which follows from two different ways of computing the Euler characteristic of the bifurcation set for a reduced polynomial of degree 2.

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