Pencil-type line arrangements of low degree: classification and monodromy

ALEXANDRU DIMCA, DENIS IBADULA AND DANIELA ANCA MACINIC

Abstract. The complete classification of $(3, 3)$-nets and of $(3, 4)$-nets with only double and triple points is given. Up to lattice isomorphism, there are exactly 3 effective possibilities in each case, and some of these provide new examples of pencil-type line arrangements. For arrangements consisting of ≤ 14 lines and having points of multiplicity ≤ 5, we show that the non-triviality of the monodromy on the first cohomology $H^1(F)$ of the associated Milnor fiber F implies the arrangement is of reduced pencil-type. In particular, the monodromy is determined by the combinatorics in such cases.