On the monodromy conjecture for a certain class of surfaces

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We consider surfaces that are generic with respect to some 3-dimensional toric idealistic cluster. A cluster is a finite sequence of infinitely near points where a multiplicity is assigned to each point. The blowing up of the cluster gives an embedded resolution for the hypersurfaces that are generic with respect to it.

Let $E_1, \ldots, E_r$ be the irreducible exceptional components created by the blowing up of a 3-dimensional toric idealistic cluster and write $E_j^\circ := E_j \setminus \cup_{i \in S \setminus \{j\}} E_i$, for j in $S := \{1, \ldots, r\}$. The topological Euler characteristics (E_j°) are of highest interest for the monodromy conjecture. In this specific toric context we compute these numbers (E_j°).

By combinatorial arguments we determine their sign and we study when they are equal to 0. We apply this classification to prove the monodromy conjecture for this class of surfaces.