

Upper triangular matrices and induced structures: vanishing cycles, monodromy groups, distinguished bases, braid group orbits, moduli spaces

Claus Hertling

University of Mannheim

Upper triangular matrices with ones on the diagonal and entries which are integers (or algebraic integers) arise in many contexts, e.g. as Stokes matrices in the theory of meromorphic connections with irregular poles, in many situations in algebraic geometry (often related to Stokes matrices), especially in quantum cohomology and the theory of isolated hypersurface singularities, but also in the theory of Coxeter groups.

Concepts from singularity theory like vanishing cycles, monodromy groups, Seifert forms, tuples of (pseudo-)reflections and distinguished bases can be derived from upper triangular matrices in cases beyond singularity theory and are interesting to study.

Additionally, always braid group actions on the matrices and on the distinguished bases are in the background. They give rise to certain covering spaces of the classifying space of the braid group. These are interesting natural global manifolds. Some are well known, others are new.

The talk presents concepts and old and new results. It puts emphasis on some cases from singularity theory and some 3x3 cases.