

Computing mixed Hodge structures on singular hypersurfaces

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Periods of smooth projective varieties encode the Hodge decomposition on cohomology and they interlink transcendental number theory with algebraic geometry through Hodge cycles. We will briefly review how to compute periods of smooth hypersurfaces and how to use them to compute Hodge cycles. It is of interest to compute periods of resolutions of singular hypersurfaces or even periods of complete intersections (which are to be viewed as a component of the singular locus of a union of hypersurfaces). This can be achieved by first computing the mixed Hodge structure (MHS) on the given singular hypersurface. We will explain what this means and how we compute the MHS of a hypersurface given by its polynomials using numerical transcendental methods.