

Periods of Hypersurfaces Via Effective Homology

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The period matrix of a smooth complex projective variety X encodes the isomorphism between the singular homology of X and its De Rham cohomology given by the De Rham theorem. Numerical approximations with sufficient precision of the entries of this matrix, called periods, allow to recover some algebraic invariants of the varieties, as shown for example by Torelli-type theorems. I will present a method relying on the computation of an effective description of the homology for obtaining such numerical approximations of the periods of hypersurfaces. This method is sufficiently efficient to allow computing the periods of dense quartic K3 surfaces in the three-dimensional projective space.

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