
JOHN VOIGHT, University of Vermont

Kronecker's Jugendtraum and power series expansions of modular forms

In Kronecker's Jugendtraum, abelian extensions of an imaginary quadratic field are constructed by special values of modular functions on classical modular curves. In practical terms, this allows one to find generating polynomials for number fields arising from class field theory using numerical methods. We extend Kronecker's Jugendtraum to CM number fields in this explicit way by computing special values of functions on Shimura curves over totally real fields. To do so, we exhibit a method to numerically compute power series expansions of modular forms on a cocompact Fuchsian group, using the explicit computation a fundamental domain and linear algebra.