

Hodge volumes and effective Schottky problem

Samuel Grushevsky
Department of Mathematics
Harvard University

Abstract

Schottky problem is the question of determining which abelian varieties are jacobians of Riemann surfaces. The problem was posed by Schottky in 1880s, and solved by Shiota in 1986. However, Shiota's solution is not effective in the sense that given an explicit abelian variety, one cannot decide whether it is a jacobian or not.

We show that the degree of equations for the Jacobians locus is equal up to a constant factor to the Hodge volume of the moduli space, which then allows us to compute this degree explicitly in low genera and to get an explicit upper bound for the degree for any genera. Combining this upper bound with effective Nullstellensatz we then obtain an effective method for solving Schottky problem.