

Cambridge University Press

978-0-521-69964-8 - Ranks of Elliptic Curves and Random Matrix Theory

Edited by J. B. Conrey, D. W. Farmer, F. Mezzadri and N. C. Snaith

Table of Contents

[More information](#)

v

Contents

Introduction 1*J. B. Conrey, D. W. Farmer, F. Mezzadri, and N. C. Snaith*

FAMILIES

Elliptic curves, rank in families and random matrices 7*E. Kowalski***Modeling families of L -functions** 53*D. W. Farmer***Analytic number theory and ranks of elliptic curves** 71*M. P. Young***The derivative of $SO(2N + 1)$ characteristic polynomials and rank 3 elliptic curves** 93*N. C. Snaith***Function fields and random matrices** 109*D. Ulmer***Some applications of symmetric functions theory in random matrix theory** 143*A. Gamburd*

RANKS OF QUADRATIC TWISTS

The distribution of ranks in families of quadratic twists of elliptic curves 171*A. Silverberg***Twists of elliptic curves of rank at least four** 177*K. Rubin and A. Silverberg***The powers of logarithm for quadratic twists** 189*C. Delaunay and M. Watkins***Note on the frequency of vanishing of L -functions of elliptic curves in a family of quadratic twists** 195*C. Delaunay***Discretisation for odd quadratic twists** 201*J. B. Conrey, M. O. Rubinstein, N. C. Snaith and M. Watkins*

Cambridge University Press

978-0-521-69964-8 - Ranks of Elliptic Curves and Random Matrix Theory

Edited by J. B. Conrey, D. W. Farmer, F. Mezzadri and N. C. Snaith

Table of Contents

[More information](#)

vi

Secondary terms in the number of vanishings of quadratic twists of elliptic curve L -functions 215

J. B. Conrey, A. Pokharel, M. O. Rubinstein and M. Watkins

Fudge Factors in the Birch and Swinnerton-Dyer Conjecture 233

K. Rubin

NUMBER FIELDS AND HIGHER TWISTS

Rank distribution in a family of cubic twists 237

M. Watkins

Vanishing of L -functions of elliptic curves over number fields 247

C. David, J. Fearnley and H. Kisilevsky

SHIMURA CORRESPONDENCE, AND TWISTS

Computing central values of L -functions 260

F. Rodriguez-Villegas

Computation of central value of quadratic twists of modular L -functions 273

Z. Mao, F. Rodriguez-Villegas and G. Tornara

Examples of Shimura correspondence for level p^2 and real quadratic twists 289

A. Pacetti and G. Tornara

Central values of quadratic twists for a modular form of weight 4 315

H. Rosson and G. Tornara

GLOBAL STRUCTURE: SHA AND DESCENT

Heuristics on class groups and on Tate-Shafarevich groups 323

C. Delaunay

A Note on the 2-Part of III for the Congruent Number Curves 341

D.R. Heath-Brown

2-Descent Through the Ages 345

P. Swinnerton-Dyer