Meromorphic Continuation of Multivariable Euler Products and Applications.

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Abstract. This article extends classical one variable results about Euler products defined by integral valued polynomial or analytic functions to several variables. We show there exists a meromorphic continuation up to a presumed natural boundary, and also give a criterion, à la Estermann-Dahlquist, for the existence of a meromorphic extension to $\mathbb{C}^n$. Among applications we deduce analytic properties of height zeta functions for toric varieties over $\mathbb{Q}$ and group zeta functions.

Mathematics Subject Classifications: 11M41, 11N37, 14G05, 32D15.

Key words: several variables zeta functions, Euler product, analytic continuation, Manin's conjecture, Rational points, zeta functions of groups.

Introduction:

There are two fundamental problems in the study of Dirichlet series that admit an Euler product expansion in a region of absolute convergence. The first problem is to prove the existence of a meromorphic continuation into a larger region. Assuming this is possible, the second problem is to describe precisely the boundary of the domain for this meromorphic function. For Dirichlet series in one variable, the first important results go back to Estermann [13] who proved that if $h(Y) = \sum_d F(d)Y^d$, where $F(d)$ is a "ganzwertige" polynomial and $F(0) = 1$, then $Z(s) = \prod_p h(p^{-s})$ is absolutely convergent for $\Re(s) > 1$ and can be meromorphically continued to the half plane $\Re(s) > 0$. Moreover, $Z(s)$ be continued to the whole complex plane if and only if $h(Y)$ is a cyclotomic polynomial. Subsequently, Dahlquist [6] extended this result to h any analytic function with isolated singularities within the unit circle.

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Meromorphic Continuation Functional Eq

Shek-Tung Wong

Meromorphic Continuation Functional Eq:

The Meromorphic Continuation and Functional Equations of Cuspidal Eisenstein Series for Maximal Cuspidal Subgroups Shek-Tung Wong,1990 We carry out in the context of an algebraic group and an arithmetic subgroup an idea of Selberg for continuing Eisenstein series It makes use of the theory of integral operators The meromorphic continuation and functional equation of an Eisenstein series constructed with a cusp form on the Levi component of a rank one cuspidal subgroup are established **Function Theory of One Complex Variable** Robert Everist Greene,Steven George Krantz,2006 Complex analysis is one of the most central subjects in mathematics It is compelling and rich in its own right but it is also remarkably useful in a wide variety of other mathematical subjects both pure and applied This book covers complex variables as a direct development from multivariable real calculus **Fourier Analysis on Number Fields** Dinakar Ramakrishnan,Robert J. Valenza,2013-04-17 This book grew out of notes from several courses that the first author has taught over the past nine years at the California Institute of Technology and earlier at the Johns Hopkins University Cornell University the University of Chicago and the University of Crete Our general aim is to provide a modern approach to number theory through a blending of complementary algebraic and analytic perspectives emphasizing harmonic analysis on topological groups Our more particular goal is to cover Jolm Tate s visionary thesis giving virtually all of the necessary analytic details and topological preliminaries technical prereq uisites that are often foreign to the typical more algebraically inclined number theorist Most of the existing treatments of Tate s thesis including Tate s own range from terse to cryptic our intent is to be more leisurely more comprehen sive and more comprehensible To this end we have assembled material that has admittedly been treated elsewhere but not in a single volume with so much detail and not with our particular focus We address our text to students who have taken a year of graduate level courses in algebra analysis and topology While our choice of objects and methods is naturally guided by the specific mathematical goals of the text our approach is by no means narrow In fact the subject matter at hand is germane not only to budding number theorists but also to students of harmonic analysis or the representation theory of Lie groups *Number Theory* Sinnou David,1995 This is the fourteenth annual volume arising from the Seminaire de Theorie de Nombres de Paris covering the whole spectrum of number theory Lectures on Automorphic L-functions James W. Cogdell,Henry H. Kim,James W. Cogdell, Henry H. Kim, and M. Ram Murty,M. Ram Murty, James W Cogdell Lectures on L functions converse theorems and functoriality for GL_n Preface Modular forms and their L functions Automorphic forms Automorphic representations Fourier expansions and multiplicity one theorems Eulerian integral representations Local L functions The non Archimedean case The unramified calculation Local L functions The Archimedean case Global L functions Converse theorems Functoriality Functoriality for the classical groups Functoriality for the classical groups II Henry H Kim Automorphic L functions Introduction Chevalley groups and their properties Cuspidal representations L groups and automorphic L functions Induced representations Eisenstein series and constant terms L functions in the

constant terms Meromorphic continuation of L functions Generic representations and their Whittaker models Local coefficients and non constant terms Local Langlands correspondence Local L functions and functional equations Normalization of intertwining operators Holomorphy and bounded in vertical strips Langlands functoriality conjecture Converse theorem of Cogdell and Piatetski Shapiro Functoriality of the symmetric cube Functoriality of the symmetric fourth Bibliography M Ram Murty Applications of symmetric power L functions Preface The Sato Tate conjecture Maass wave forms The Rankin Selberg method Oscillations of Fourier coefficients of cusp forms Poincare series Kloosterman sums and Selberg s conjecture Refined estimates for Fourier coefficients of cusp forms Twisting and averaging of L series The Kim Sarnak theorem Introduction to Artin L functions Zeros and poles of Artin L functions The Langlands Tunnell theorem Bibliography

   Automorphic Forms and Representations Daniel Bump,1998-11-28 This book takes advanced graduate students from the foundations to topics on the research frontier   A Functional Equation for Some Selberg Zeta Functions Jeffrey Stopple,1986   Bulletin (new Series) of the American Mathematical Society ,1916   Eisenstein Series on the Metaplectic Group G. F. Helminck,1983   Theory of Functions of a Complex Variable Andrew Russell Forsyth,1900 This book is a collection of treaties and memoirs exploring the growing field of theory of functions   The Madison Colloquium 1913 American Mathematical Society. Colloquium,Leonard Eugene Dickson,William Fogg Osgood,1914   The Madison colloquium 1913 New York American mathematical society (Colloquium, 7th, Madison, 1913),1914   Automorphic Forms, Automorphic Representations, and Arithmetic Robert S. Doran,Ze Li Dou,George T. Gilbert,1999 The ten lectures by Goro Shimura that formed the core of the conference have been published separately Here 22 papers represent most of the other talks and additional contributions many by his students The topics include period torsors critical values of twisted tensor L functions over CM fields zeta functions formed with modular symbols Frobenius distributions and Galois representations metaplectic generating functions and Shimura integrals the Plancherel measure for the continuous spectrum of the modular group the Euler factorization of global integrals omega results for automorphic L series and truncated integrals and the Shintani zeta function for the space of binary quartic forms The two volumes are paged separately neither is indexed Annotation copyrighted by Book News Inc Portland OR   A Treatise on the Theory of Functions James Harkness,Frank Morley,1893   Inverse Problems for Nonsmooth First Order Perturbations of the Laplacian Mikko Salo,2004   Number Theory :proceedings of the 1985 Montreal Conference Held June 17-29, 1985 H. Kisilevsky,J. Labute,1987   **Indiana University Mathematics Journal** Indiana University. Department of Mathematics,1976   Journal of the Ramanujan Mathematical Society ,2003   **Acta Arithmetica** ,2011   **Elliptic Curves** R. V. Gurjar,2006 These notes constitute a lucid introduction to Elliptic Curves one of the central and vigorous areas of current mathematical research The subject has been studied from diverse viewpoints analytic algebraic and arithmetical These notes offer the reader glimpses of all three aspects and present some of the basic important theorems in all of them The first part introduces a little of the theory of

Riemann surfaces and goes on to the study of tori and their projective embeddings as cubics This part ends with a discussion of the identification of the moduli space of complex tori with the quotient of the upper half plane by the modular groups The second part handles the algebraic geometry of elliptic curves It begins with a rapid introduction to some basic algebraic geometry and then focuses on elliptic curves The Rieman Roch theorem and the Riemann hypothesis for elliptic curves are proved and the structure of the endomorphism ring of an elliptic curve is described The third and last part is on the arithmetic of elliptic curves over Q The Mordell Weil theorem Mazur s theorem on torsion in rational points of an elliptic curve over Q and theorems of Thue and Siegel are among the results which are presented There is a brief discussion of theta functions Eisenstein series and cusp forms with an application to representation of natural numbers as sums of squares The notes end with the formulation of the Birch and Swinnerton Dyer conjectures There is an additional brief chapter Appendix C written in July 2004 by Kirti Joshi describing some developments since the original notes were written up in the present form in 1992

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