

Contents

Harmonic Sums, Polylogarithms, Special Numbers, and Their Generalizations	1
Jakob Ablinger and Johannes Blümlein	
Multiple Zeta Values and Modular Forms in Quantum Field Theory	33
David Broadhurst	
Computer-Assisted Proofs of Some Identities for Bessel Functions of Fractional Order	75
Stefan Gerhold, Manuel Kauers, Christoph Koutschan, Peter Paule, Carsten Schneider, and Burkhard Zimmermann	
Conformal Methods for Massless Feynman Integrals and Large N_f Methods	97
John A. Gracey	
The Holonomic Toolkit	119
Manuel Kauers	
Orthogonal Polynomials	145
Tom H. Koornwinder	
Creative Telescoping for Holonomic Functions	171
Christoph Koutschan	
Renormalization and Mellin Transforms	195
Dirk Kreimer and Erik Panzer	
Relativistic Coulomb Integrals and Zeilberger’s Holonomic Systems Approach. I	225
Peter Paule and Sergei K. Suslov	
Hypergeometric Functions in <i>Mathematica</i>[®]	243
Oleksandr Pavlyk	

Solving Linear Recurrence Equations with Polynomial Coefficients..... 259
Marko Petkovšek and Helena Zakrajšek

Generalization of Risch’s Algorithm to Special Functions 285
Clemens G. Raab

Multiple Hypergeometric Series: Appell Series and Beyond 305
Michael J. Schlosser

Simplifying Multiple Sums in Difference Fields 325
Carsten Schneider

Potential of FORM 4.0..... 361
Jos A.M. Vermaseren

Feynman Graphs 381
Stefan Weinzierl

Index..... 407



<http://www.springer.com/978-3-7091-1615-9>

Computer Algebra in Quantum Field Theory
Integration, Summation and Special Functions

Schneider, C.; Blümlein, J. (Eds.)

2013, XIV, 411 p. 41 illus., Hardcover

ISBN: 978-3-7091-1615-9