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Nota di contenuto	Preface -- Part I: A. D. Bruno, Elements of nonlinear analysis -- Part II Summability of Divergent solutions of PDEs: K. Ichinobe, On k-summability of formal solutions for a class of higher order partial differential equations with time-dependent coefficients -- J. E. Lope and M- P. F. Ona, Singular solutions to a system of equations related to Ricci-flat Kähler metrics -- S. Michalik and M. Suwinska, Huperasymptotic solutions for certain partial differential equations -- B. Tkacz, The Stokes phenomenon for certain PDEs in a case when initial data have a finite set of singular points -- H. Yamane, Soliton resolution for the focusing integrable discrete nonlinear Schrödinger equation -- A. D. Bruno, Complicated and exotic expansions of solutions to the Painlevé equations -- Part III Summability of Divergent solutions of ODEs: P. Pavis d'Esdurac, The Borel transform values and its singularities.-A. Shafarevich, Quantization conditions on Riemannian surfaces and spectral series of non-selfadjoint operators -- T. Oshima, Semilocal monodromy of rigid local systems -- M. Barkatou, On the Newton polygon of a Moser-irreducible linear differential system -- Part IV Related Topics: G. Lysik, Uniqueness property for $\rho$ -

Analytic functions -- N. Honda and L. Prelli, On the algebraic study of asymptotics -- D. Guzzetti, Deformations with a resonant irregular singularity -- G. Filipuk and M. N. Rebocho, Symmetric semi-classical orthogonal polynomials of class one on  $q$ -quadratic lattices -- C. Hermoso, E. J. Huertas and A. Lastra, Determinantal for ladder operators in a problema concerning a convex linear combination of discrete and continuous measures.

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## Sommario/riassunto

These proceedings provide methods, techniques, different mathematical tools and recent results in the study of formal and analytic solutions to Diff. (differential, partial differential, difference,  $q$ -difference,  $q$ -difference-differential.... ) Equations. They consist of selected contributions from the conference "Formal and Analytic Solutions of Diff. Equations", held at Alcalá de Henares, Spain during September 4-8, 2017. Their topics include summability and asymptotic study of both ordinary and partial differential equations. The volume is divided into four parts. The first paper is a survey of the elements of nonlinear analysis. It describes the algorithms to obtain asymptotic expansion of solutions of nonlinear algebraic, ordinary differential, partial differential equations, and of systems of such equations. Five works on formal and analytic solutions of PDEs are followed by five papers on the study of solutions of ODEs. The proceedings conclude with five works on related topics, generalizations and applications. All contributions have been peer reviewed by anonymous referees chosen among the experts on the subject. The volume will be of interest to graduate students and researchers in theoretical and applied mathematics, physics and engineering seeking an overview of the recent trends in the theory of formal and analytic solutions of functional (differential, partial differential, difference,  $q$ -difference,  $q$ -difference-differential) equations in the complex domain.

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