

1. Record Nr.	UNISA996213651403316
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Titolo	Formal Algorithmic Elimination for PDEs [[electronic resource] /] / by Daniel Robertz
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2014
ISBN	3-319-11445-X
Edizione	[1st ed. 2014.]
Descrizione fisica	1 online resource (VIII, 283 p. 6 illus., 3 illus. in color.)
Collana	Lecture Notes in Mathematics, , 0075-8434 ; ; 2121
Disciplina	512.94
Soggetti	Algebra Field theory (Physics) Commutative algebra Commutative rings Associative rings Rings (Algebra) Partial differential equations Field Theory and Polynomials Commutative Rings and Algebras Associative Rings and Algebras Partial Differential Equations
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes Index.
Nota di contenuto	Introduction -- Formal Methods for PDE Systems -- Differential Elimination for Analytic Functions -- Basic Principles and Supplementary Material -- References -- List of Algorithms -- List of Examples -- Index of Notation -- Index.
Sommario/riassunto	Investigating the correspondence between systems of partial differential equations and their analytic solutions using a formal approach, this monograph presents algorithms to determine the set of analytic solutions of such a system and conversely to find differential equations whose set of solutions coincides with a given parametrized set of analytic functions. After giving a detailed introduction to Janet bases and Thomas decomposition, the problem of finding an implicit

description of certain sets of analytic functions in terms of differential equations is addressed. Effective methods of varying generality are developed to solve the differential elimination problems that arise in this context. In particular, it is demonstrated how the symbolic solution of partial differential equations profits from the study of the implicitization problem. For instance, certain families of exact solutions of the Navier-Stokes equations can be computed.
