Record Nr. UNISALENTO991002946179707536 Autore Robertz, Daniel Titolo Formal algorithmic elimination for PDEs [e-book] / Daniel Robertz Cham [Switzerland]: Springer, 2014 Pubbl/distr/stampa **ISBN** 9783319114453 Descrizione fisica 1 online resource (viii, 283 pages) Collana Lecture notes in mathematics, 1617-9692; 2121 Classificazione **AMS 12H05** AMS 13P10 AMS 16S36 AMS 35-02 LC QA192.R62 Disciplina 512.94 Soggetti Differential equations, Partial Elimination Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Nota di bibliografia Includes bibliographical references and 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 Investigating the correspondence between systems of partial Sommario/riassunto 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