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Nota di contenuto	1 Tommaso Sorgente et al., VEM and the Mesh -- 2 Dibyendu Adak et al., On the implementation of Virtual Element Method for Nonlinear problems over polygonal meshes -- 3 Long Chen and Xuehai Huang, Discrete Hessian Complexes in Three Dimensions -- 4 Edoardo Artioli et al., Some Virtual Element Methods for Infinitesimal Elasticity Problems -- 5 Lourenço Beirão da Veiga and Giuseppe Vacca, An introduction to second order divergence-free VEM for fluidodynamics -- 6 Gabriel N. Gatica et al, A virtual marriage à la mode: some recent results on the coupling of VEM and BEM -- 7 Daniele Boffi et al., Virtual element approximation of eigenvalue problems -- 8 David Mora and Alberth Silgado, Virtual element methods for a stream-function formulation of the Oseen equations -- 9 Lorenzo Mascotto et al., The nonconforming Trefftz virtual element method: general setting, applications, and dispersion analysis for the Helmholtz equation -- 10 Paola F. Antonietti et al., The conforming virtual element method for polyharmonic and elastodynamics problems: a review -- 11 Edoardo Artioli et al., The virtual element method in nonlinear and fracture solid mechanics -- 12 Sebastián Naranjo Álvarez et al., The virtual element method for the coupled system of magneto-hydrodynamics -- 13 Peter

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Sommario/riassunto

The purpose of this book is to present the current state of the art of the Virtual Element Method (VEM) by collecting contributions from many of the most active researchers in this field and covering a broad range of topics: from the mathematical foundation to real life computational applications. The book is naturally divided into three parts. The first part of the book presents recent advances in theoretical and computational aspects of VEMs, discussing the generality of the meshes suitable to the VEM, the implementation of the VEM for linear and nonlinear PDEs, and the construction of discrete hessian complexes. The second part of the volume discusses Virtual Element discretization of paradigmatic linear and non-linear partial differential problems from computational mechanics, fluid dynamics, and wave propagation phenomena. Finally, the third part contains challenging applications such as the modeling of materials with fractures, magneto-hydrodynamics phenomena and contact solid mechanics. The book is intended for graduate students and researchers in mathematics and engineering fields, interested in learning novel numerical techniques for the solution of partial differential equations. It may as well serve as useful reference material for numerical analysts practitioners of the field.