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Titolo	Mathematical Theory of Evolutionary Fluid-Flow Structure Interactions [[electronic resource] /] / by Barbara Kaltenbacher, Igor Kukavica, Irena Lasiecka, Roberto Triggiani, Amjad Tuffaha, Justin T. Webster
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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	An introduction to a fluid-structure model -- Linear parabolic-hyperbolic fluid-structure interaction models -- Flow-plate interactions: well-posedness and long-time behavior -- Some aspects in nonlinear acoustics coupling and shape optimization.
Sommario/riassunto	This book is devoted to the study of coupled partial differential equation models, which describe complex dynamical systems occurring in modern scientific applications such as fluid/flow-structure interactions. The first chapter provides a general description of a fluid-structure interaction, which is formulated within a realistic framework, where the structure subject to a frictional damping moves within the fluid. The second chapter then offers a multifaceted description, with often surprising results, of the case of the static interface; a case that is argued in the literature to be a good model for small, rapid oscillations of the structure. The third chapter describes flow-structure interaction where the compressible Navier-Stokes equations are replaced by the linearized Euler equation, while the solid is taken as a nonlinear plate, which oscillates in the surrounding gas flow. The final chapter focuses on a the equations of nonlinear acoustics coupled with linear acoustics or elasticity, as they arise in the context of high intensity ultrasound applications.