1.	Record Nr.	UNINA9910299972603321
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	Titolo	Introduction to Vortex Filaments in Equilibrium / / by Timothy D. Andersen, Chjan C. Lim
	Pubbl/distr/stampa	New York, NY : , : Springer New York : , : Imprint : Springer, , 2014
	ISBN	1-4939-1938-5
	Edizione	[1st ed. 2014.]
	Descrizione fisica	1 online resource (146 p.)
	Collana	Springer Monographs in Mathematics, , 2196-9922
	Disciplina	531.1133
	Soggetti	Mathematics - Data processing
		Mathematical physics
		Continuum mechanics
		Computational Science and Engineering
		Theoretical, Mathematical and Computational Physics
		Continuum Mechanics
		Mathematical Physics
	Lingua di pubblicazione	Inglese
	Formato	Materiale a stampa
	Livello bibliografico	Monografia
	Note generali	Description based upon print version of record.
	Nota di bibliografia	Includes bibliographical references and index.
	Nota di contenuto	Introduction -- Vortex Filaments and Where to Find Them -- Statistical Mechanics -- Parallel Filaments -- Curved Filaments -- Quantum Fluids -- Plasmas -- Computational Methods -- Quasi 2-D Monte Carlo in Deep Ocean Convection -- Conclusion.
	Sommario/riassunto	This book presents fundamental concepts and seminal results to the study of vortex filaments in equilibrium. It also presents new discoveries in quasi-2D vortex structures with applications to geophysical fluid dynamics and magnetohydrodynamics in plasmas. It fills a gap in the vortex statistics literature by simplifying the mathematical introduction to this complex topic, covering numerical methods, and exploring a wide range of applications with numerous examples. The authors have produced an introduction that is clear and easy to read, leading the reader step-by-step into this topical area. Alongside the theoretical concepts and mathematical formulations, interesting applications are discussed. This combination makes the text useful for students and researchers in mathematics and physics.