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Nota di contenuto	Liutex and Third Generation of Vortex Definition and Identification -- Galilean Variance of streamline in vortex/Liutex visualization -- Rules of tensor and matrix operation for Liutex calculation -- Liutex Core Tube for Vortex Visualization and Structure -- Study of Vortex and Vorticity in a Laminar Flow -- POD Analysis on Losing Symmetry of Vortex Structure in the Flow Transition by Liutex Method -- The Liutex Shear Interaction in Boundary Layer Transition -- Liutex Shear Interaction in Turbulent Channel Flow -- Experimental studies on the evolution of hairpin vortex package in the boundary layer of a square tube -- The Correlation between Pressure Fluctuation and Liutex Spectrum in Boundary Layer Transition -- Statistical Analysis for Liutex Growth in Flow Transition -- Three-Dimensional Vortex Structure Identification of Fluid Coupling and Analysis of Spatial-Temporal Evolution Mechanism -- Numerical Simulation and Analysis of Two-phase Flow Around Cylinder using Pseudo-Potential Model and Liutex Method -- Analysis of Vortices Shed by Generic Submarines based on Liutex -- Vortex Identification Methods Applied to Complex Viscous Flow Field of Ship in Restricted Waters -- The Applicability of Third Vortex Identification Methods on Atmospheric Boundary Layer and Turbine Wakes -- Propeller Wake and Noise Analysis based on the Third-Generation Vortex -- Identification of Vortex around High-Speed

Ship based on Liutex Method -- Identification of Vortical Structures of Flows past a Surface-piercing Finite Square Cylinder with Rounded Corners -- Comparison of Vortex Identification Methods Based on the Liutex Decomposition and Application in a Compressor Cascade -- Research on Vortex Structure of All-Oxygen MILD Combustion Reheating Furnace based on Third-Generation Vortex Identification Method -- The Effect of Fluidic Pintle Nozzle on the Ablative Features -- Liutex Investigation of Backflow Leakage in a Shaft-less Rim-Driven Thruster -- Application of Omega Identification Method in the Ventilated Cavities around a Surface-Piercing Hydrofoil -- Study on Fluid-Borne Noise around a Cylinder based on Vortex Sound Theory with Liutex-Shear Decomposition -- Coherent Structures Analysis across Cavity Interface in Cloud Cavitating Flows using Different Vortex Identification Methods.

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### Sommario/riassunto

This proceedings highlights the applications of the newly introduced physical quantity Liutex in hydrodynamics and aerodynamics. Liutex is used to represent the fascinating rotational motion of fluids, i.e., the vortex. Ubiquitously seen in nature and engineering applications, the definition of vortices has been elusive. The Liutex vector provides a unique and systematic description of vortices. The proceedings collects papers presented in the invited workshop "Liutex and Third Generation of Vortex Identification for Engineering Applications" from Aerospace and Aeronautics World Forum 2021. The papers in this book cover both the theoretical aspects of Liutex and many applications in hydrodynamics and aerodynamics. The proceedings is a good reference for researchers in fluid mechanics who are interested in learning about the wide scope of applications of Liutex and using it to develop a new understanding of their research subjects.

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