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	Nota di contenuto	Preliminaries -- Introduction -- Problem Formulation and Tools -- Numerics -- Discretization -- Overlapping communication and computation -- A Test Bed for the Numerical Tool -- Physics -- The neutrally stratied Ekman Layer -- Turbulence Regimes and Stability -- Flow Organization and Global Intermittency Under Strong Stratication -- Concluding Remarks._ Implications for the Study of the Atmospheric Boundary layer -- Résumé -- Appendices.
	Sommario/riassunto	This thesis presents a study of strong stratification and turbulence collapse in the planetary boundary layer, opening a new avenue in this field. It is the first work to study all regimes of stratified turbulence in a unified simulation framework without a break in the paradigms for representation of turbulence. To date, advances in our understanding and the parameterization of turbulence in the stable boundary layer have been hampered by difficulties simulating the strongly stratified

regime, and the analysis has primarily been based on field measurements. The content presented here changes that paradigm by demonstrating the ability of direct numerical simulation to address this problem, and by doing so to remove the uncertainty of turbulence models from the analysis. Employing a stably stratified Ekman layer as a simplified physical model of the stable boundary layer, the three stratification regimes observed in nature— weakly, intermediately and strongly stratified—are reproduced, and the data is subsequently used to answer key, long-standing questions. The main part of the book is organized in three sections, namely a comprehensive introduction, numerics, and physics. The thesis ends with a clear and concise conclusion that distills specific implications for the study of the stable boundary layer. This structure emphasizes the physical results, but at the same time gives relevance to the technical aspects of numerical schemes and post-processing tools. The selection of the relevant literature during the introduction, and its use along the work appropriately combines literature from two research communities: fluid dynamics, and boundary-layer meteorology. .