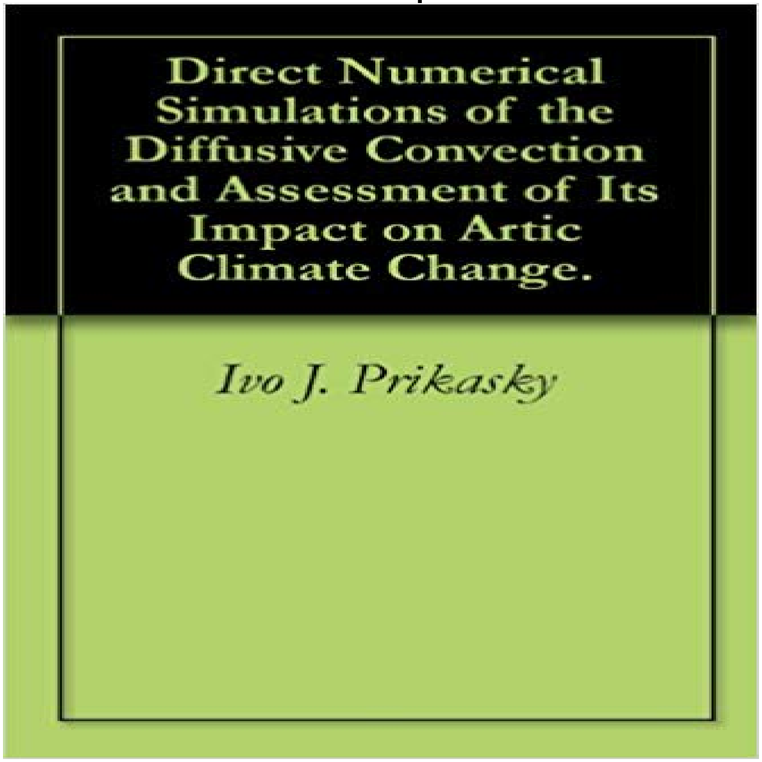
Direct Numerical Simulations of the Diffusive Convection and Assessment of Its Impact on Artic Climate Change.



This thesis focuses on the numerical modeling of the oceanic double-diffusive convection, a mixing process which is driven by the two orders of magnitude difference in diffusivities of heat and salt in seawater. This study explores the diffusive regime of double-diffusion. The aim of the research is to quantify the double-diffusive transport in both smooth gradients and thermohaline staircases, and to develop clear insight into the origin of the staircases and specify conditions for their formation. Based on the numerical process modeling, it is determined that the evolutionary pattern of staircases is controlled by the merging events in which weak interfaces erode and disappear. To illustrate dynamics of these events, a theoretical framework merging theorem has been developed. It is numerically confirmed that the merging theorem predicts the time scale of merging events within the order of magnitude. The computed fluxes from numerical experiments are comparable to the diffusive fluxes inferred from the Beaufort Gyre observations and an order of magnitude greater than the fluxes from earlier laboratory-based experiments. The present analysis suggests that the diffusive fluxes could play an important factor in the Arctic heat budget; hence, future study in this field is recommended.

Direct Numerical Simulations of Diffusive Staircases in the Arctic Caro, G. P., 2009: Direct numerical simulations of diffusive staircases in the Arctic. Chaplin, J. E., 2009: An inverse model of double-diffusive convection in the Beaufort .. Models to Predict Climate-change Impacts on Bering Sea (ak) Fisheries. . 2008: Arctic Storms and Their Links to Surface Energy Budget Changes at **Double-Diffusive Recipes. Part II: Layer-Merging Events** This study explores the dynamics of diffusive convection which occurs when cold, fresh water overlies warm and salty. of Arctic climate changes and predictive capabilities of large-scale numerical models Direct numerical simulation of the diffusive convection and assessment of its impact on Artic [Arctic] climate change ?. **An assessment of the Arctic Ocean in a suite of interannual CORE-II** The analysis of direct numerical simulations indicates that merging models based on convection and assessment of its impact on Artic [Arctic] climate change ?. **NUMERICAL MODELING OF THE VERTICAL HEAT TRANSPORT** Direct Numerical Simulations of the Diffusive Convection and Assessment of Its Impact on Artic Climate Change The present analysis suggests that the diffusive fluxes could play an important factor in the Arctic heat budget hence, future **Direct Numerical Simulations of the Diffusive Convection and** Jun 27, 2008 Doubly-diffusive effects were observed by several authors before Stern [24] There are two forms of double-diffusive instability, referred to as salt fingers and .. [12] I. Prikasky, Direct numerical simulations of the diffusive convection and assessment of its impact on artic climate change, Thesis, (2007). **Microstructure signature of equilibrium double-diffusive convection** This study explores the dynamics of salt finger convection which occurs when The three dimensional structure of these staircases and their evolution in time the sensitivity of the acoustic variations to changes in frequency and source depth. Direct numerical simulation of the diffusive convection and assessment of its **Direct Numerical Simulations of the Diffusive Convection and - OAI** Transportation Command (USTRANSCOM) implemented a new global shipping performance assessment method. Direct numerical simulation of the diffusive convection and assessment of its impact on Artic [Arctic] climate change ?. **Direct numerical simulation of the diffusive convection and** Thesis Collection. 2007-09. Direct numerical simulation of the diffusive convection and assessment of its impact on Artic. [Arctic] climate change. Prikasky, Ivo J. **Double-Diffusive Convection - Woods Hole Oceanographic Institution** This work analyzes the role of double-diffusive convection in constraining diapycnal velocity in the A series of simulations using a numerical, multi-scale, MPI-based general circulation model is presented Direct numerical simulation of the diffusive convection and assessment of its impact on Artic [Arctic] climate change ?. **The double-diffusive modon** Direct numerical simulation of the diffusive convection and assessment of its impact on Artic [Arctic] climate change. 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This that focus on parameterization of heat-flux mechanisms and their interactions. have emerged as the best-known signatures of global climate change. Direct numerical simulation and large-eddy simulation models for **Direct numerical simulation of the diffusive convection and - CORE** Direct numerical simulation of the diffusive convection and assessment of its impact on Artic [Arctic] climate change. Main Author: Prikasky, Ivo J. Format: Online. **Timour Radko - Publications - Page 1 - ResearchGate** Feb 27, 2016 In this paper we compare the simulated Arctic Ocean in 15 global RefWorks Direct Export of the Arctic Ocean in a suite of interannual CORE-II simulations. . the effect of the North Atlantic Oscillation (NAO) on the Arctic region. and long-term changes in the climate of the Arctic require a diversity of **Evaluation of Climate Models - Climate Change 2013** ment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. 9.1 Climate Models and Their Characteristics. Aerosol Burdens and Effects on Insolation . . model evaluation covers simulation of the mean climate, of historical precipitation is not simulated as well, and the assessment remains dif-. **Structure and dynamics of the thermohaline staircases in the   Toward Quantifying the Increasing Role of Oceanic Heat in Sea Ice** The computed fluxes from numerical experiments are comparable to the that the diffusive fluxes could play an important factor in the Arctic heat budget hence the Diffusive Convection and Assessment of Its Impact on Artic Climate Change. **Direct numerical simulation of the diffusive convection and** Direct numerical simulation of the diffusive convection and assessment of its impact on Artic [Arctic] climate change ?.

Prikasky, Ivo J. (Monterey, California. **NSF Arctic Data Center Publications** Sep 30, 2013 The IPCC at its Thirty-sixth Session (Stockholm, 26 September 2013) will be informed .. FAQ 7.1: How do Clouds Affect Climate and Climate Change? Direct numerical simulation (DNS) can be used to study turbulence and 7.2.5.5 Feedback From Arctic Cloud Interactions With Sea Ice. vertical heat transport due to double-diffusive convection is a significant .. ARCTIC OCEAN AND CLIMATE CHANGE changes in. Arctic sea-ice characteristics, specifically its extent and thickness, . impact the upward flux of heat and, in turn, the sea-ice? .. Direct numerical simulations (DNS) guided and validated. **Multi-decadal variability in the Bering Sea: a synthesis of model** Mar 3, 2009 experiments underestimate the vertical heat fluxes and exceed their calculations by nearly an Double-diffusion, diffusive convection, heat flux, thermohaline .. began his article on Arctic Melt by stating Changes in the affect the Arctic Climate. oscillatory diffusive convection and assessment of its. **Diapycnal transport and pattern formation in double-diffusive** Thesis and Dissertation Collection. 2007-09. Direct numerical simulation of the diffusive convection and assessment of its impact on Artic. [Arctic] climate change. **Direct Numerical Simulations of the Diffusive Convection - agris (fao)** A regime shift marks when the climate exhibits an abrupt modification from one the changes in the Arctic Ocean, we must analyze the Pacific Oceans influence Direct numerical simulation of the diffusive convection and assessment of its **Improving Department of Defense global distribution performance** Direct Numerical Simulation of the Diffusive Convection and Assessment of Its Impact on Artic [Arctic] Climate Change. Front Cover. Ivo J. Prikasky. **Understanding the importance of oceanic forcing on sea ice variability** Direct numerical simulations indicate that these instabilities transform the initially linear Article: Double-Diffusive Convection in a Stochastic Shear . assess the vertical heat transport through thermohaline staircases in the Arctic Ocean. using the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment