

Abstract Submitted  
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**Wind-driven turbulent oscillating channel flow under a stable stratification**<sup>1</sup> WERNER KRAMER, HERMAN CLERCX, Fluid Dynamics Laboratory, Eindhoven University of Technology, The Netherlands, VINCENZO ARMINIO, Dipartimento di Ingegneria Civile ed Ambientale, Università di Trieste, Italy — An LES investigation of the oscillating channel flow subjected to a constant wind stress revealed strong shear production of the turbulence in the wall and free-surface layers. The flow during most of the phases is well described by a combination of two log-law boundary layers. If the driving oscillating pressure gradient and wind stress are aligned turbulent streaks are observed in the entire domain. For a wind stress at a 45° angle, the streaks in the free-surface and wall layer are not aligned. This results to more isotropic turbulence in the interior. We aim to investigate the effects if a stable stratification is added to this model problem for estuarine flows. The stratification is caused by a constant heat flux at the free-surface. Previous studies observed a strong stratification in the free-surface layer, which suppresses turbulent fluctuations. This might lead to a partially decoupling of the top and bottom layers. Moreover, internal waves could stir up the dynamics of the flow.

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