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Direct numerical simulation of turbulent plane Couette flow under neutral and stable stratification EVGENY MORTIKOV, Moscow State Univ — Direct numerical simulation (DNS) approach was used to study turbulence dynamics in plane Couette flow under conditions ranging from neutral stability to the case of extreme stable stratification, where intermittency is observed. Simulations were performed for Reynolds numbers, based on the channel height and relative wall speed, up to 2×10^5. Using DNS data, which covers a wide range of stability conditions, parameterizations of pressure correlation terms used in second-order closure turbulence models are discussed. Particular attention is also paid to the sustainment of intermittent turbulence under strong stratification. Intermittent regime is found to be associated with the formation of secondary large-scale structures elongated in the spanwise direction, which define spatially confined alternating regions of laminar and turbulent flow. The spanwise length of this structures increases with the increase in the bulk Richardson number and defines and additional constraint on the computational box size. In this work DNS results are presented in extended computational domains, where the intermittent turbulence is sustained for sufficiently higher Richardson numbers than previously reported.

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