

Abstract Submitted  
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**Gravity-capillary waves in countercurrent air/water turbulent flow**<sup>1</sup> FRANCESCO ZONTA, TU Wien, MIGUEL ONORATO, University of Torino, ALFREDO SOLDATI, University of Udine; TU Wien — Using the Direct Numerical Simulation (DNS) of the Navier-Stokes equations, we analyze the dynamics of the interface between air and water when both phases are driven by opposite pressure gradients (countercurrent configuration). The Reynolds number ( $Re$ ), the Weber number ( $We$ ) and the Froude number ( $Fr$ ) fully describe the physical problem. We examine the problem of the transient growth of interface waves for different combinations of physical parameters. Keeping  $Re$  constant and varying  $We$  and  $Fr$ , we show that, in the initial stages of the wave generation process, the amplitude of the interface elevation grows in time as  $t^2/5$ . Wavenumber spectra,  $E(kx)$ , of the surface elevation in the capillary range are in good agreement with the prediction of the Wave Turbulence Theory. Finally, the wave-induced modification of the average wind and current velocity profiles is addressed.

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