

Abstract Submitted  
for the DFD16 Meeting of  
The American Physical Society

**Test-filter scale effects on spectral energy transfer in direct numerical simulations of stratified turbulence** SINA KHANI, Princeton University, MICHAEL WAITE, University of Waterloo — The spectral kinetic and potential energy transfers around a test-filter scale will be presented in this talk. We use direct numerical simulations of stratified turbulence and study the up- and downscale energy transfers when different test-filter scales are applied. Our results suggest that the spectral energy transfer depends on the buoyancy Reynolds number  $Re_b$  and test-filter scale  $\Delta_{test}$ . In particular, an up-scale energy transfer (i.e. backscatter) from sub-filter scales to intermediate scales are seen when  $\Delta_{test}$  is around the dissipation scale  $L_d$ . However, we find that this spectral backscatter is due to viscous effects and not a turbulent mechanisms of stratified turbulence. In addition, our results demonstrate that effective turbulent Prandtl number spectra show constant values around  $Pr_t \approx 1$  for the local energy transfer or when the buoyancy Reynolds number is large.

Sina Khani  
Princeton University

Date submitted: 01 Aug 2016

Electronic form version 1.4