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.

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