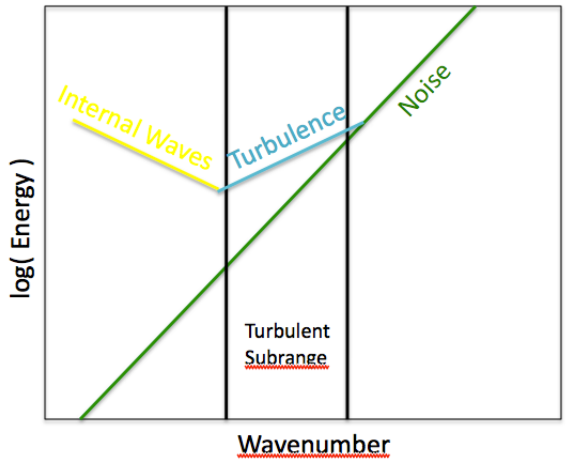
Reviewer 1 is correct that the amplitudes of the reflections are strongly affected by the vertical gradients of sound speed – stronger gradients produce stronger reflections. That is exactly the reason why we cannot directly use the data transforms to infer turbulence levels. However, the information about turbulence is contained in the lateral fluctuations of the reflections, regardless of the baseline amplitude. Therefore, we normalize the data transforms in each window and use the tracked reflections to scale the data transforms to diffusivity. This ensures the data cells closely oriented in space are comparable. The relative turbulence map (figure 6) is regionally valid while comparing data cells far apart, particularly in depth, is questionable as reflection amplitudes depend heavily on distance from seismic source and receiver. Distal comparisons are rendered relatable by the scaling to absolute diffusivities derived from the tracked reflector analysis. This hybrid approach lets the regional comparisons be made at a small scale by the data transform and the global comparisons be tempered by the absolute measures of diffusivity attained through the tracked reflector method. We have modified text in the manuscript to address there issues at lines 244-246, 365-377, and 387-389.

As pointed out by Reviewer 1, there is not a clear internal wave subrange in figure 5. We include the data transform of the entire seismic line (figure 3), as well as the various sized boxes (figure 5) to meet the criteria laid out in Holbrook et al. (2013) and show that the turbulence subrange is not a false turbulence slope caused by spectral leakage. Internal waves occur at large lateral scales in Kx space, >100s of meters, and our image does not have continuity across those scales. We can enforce continuity by limiting the data to only the clear, trackable reflectors but even then we see little obvious internal wave energy (figure 4). We have added text to address this issue in the manuscript on lines 246-250.

Concerning regions where it is difficult to track seismic reflections, Reviewer 1 expresses doubt in the usefulness of the data transform method. However, when the source wavefield is propagated throughout the ocean, it interacts with temperature and salinity gradients of every magnitude. When we plot seismic data, the brightest reflections dominate the image and represent the steepest T and S gradients. If the image were to be resized to include only "dim" reflections and scaled to show the brightest amplitudes in the new section, previously unseen reflections would appear. Tracking these reflections is problematic, as they are not long and continuous. However, the data still contains information about the T and S gradients in the new region. It is important that we normalize our analysis windows in the data transform method as the peak energies are in the noise subrange at high horizontal wavenumbers above our utilized turbulent subrange. This results in lowered relative, and thus final, measures of turbulent diffusivity where appropriate. We have added text to address this issue in the manuscript on lines 365-377. Consider the most extreme example where there is zero T or S gradient so the spectra is dominated by pure noise and compare it to an idealized case neatly organized into internal wave, turbulence, and noise characteristics where the peak energy is normalized, as seen below.



Even in this case the integrated spectral energy across the turbulent subrange would be significantly lower in the unrealistic noise scenario as the vertical axis is the log of the spectral energy. Of course, zero gradients of T and S are unlikely in the real world, particularly at the depths of this study, so the pure noise scenario is provided as evidence that even noisy low-reflectivity sections do not produce falsely elevated measures of diffusivity.

Minor comments:

- The vertical and lateral resolution used in estimating the propagation extent of the lee waves in section 2.3 are well constrained since they relate to the seafloor and the mutibeam data is accurate. However, Reviewer 1 brings up a good point that there is a range of possible values, primarily since we do not know the exact current velocity. We calculated the numbers in the manuscript from average values as reported in Eakin et al. 2011. Using the full range of velocities reported in Eakin et al. 2011, we find a range of 141-283 m for the lee wave at 40 km and a range of 145-292 m for the lee wave at 45 km. These ranges are so large as the current is reported to be 0.1 to 0.2 m/s. Our use of 0.15 m/s fits observation closely at 40 km, while the range reported here would just include the observation of 290 m propagation at 45 km. We have added text to address this issue in the manuscript on lines n284-286 and lines 455-457.
- XCTD was taken ~120 km to the northeast of the seismic section 13 days after the seismic data was collected. It is the nearest in situ T-S data we have in both time and space. We have added information about the XCTD in the manuscript on lines 321-322.
- Figures 7 and 8 do show the same region of seismic data: 570-620 m depth and 46.3-49.5 km distance along line. The different color schemes were chosen to allow the tracked reflectors to be visible.