Response to Referee #3

We are very pleased that the referee recommends publication. We also greatly appreciate the referee's constructive comments, which have proved very helpful in guiding our thinking on this topic. We address each of the referee's comments below. All of the differences between the original and new versions of the manuscript are indicated by change bars in the margin.

1. In Figure 3 the decay of the r.m.s. velocity components with time is given for the 3 stratified cases, together with least-squares fits to the data, from which it is clear that the decay rate is smaller than for HIT. However, the least-squares fits are plotted without the exponent n being indicated, making it very difficult to understand if the present DNS results are in quantitative agreement with Davidson's predictions. It is hinted at in the text that the value of n from the DNS is lower than n = 0.4 as predicted by Davidson and then a value n = 0.28 is reported in the caption of a later figure, Figure 7. These exponents are of interest and important to appreciate the accuracy of the theory and/or the difference with the simulations. Similarly to the non-stratified cases where n is explicitly given, please give values for n for all 3 cases regarding the decay of u' and v'. Along the same lines, I would recommend stating the exponents of $L_h \sim t^m$ and $L_v \sim t^p$ obtained from least-squares fits to the curves in figure 4 for Case III.

2. The evolution of horizontal spectra is considered and they are seen to evolve significantly from the initial spectrum valid for HIT. A similar and probably greater evolution is expected for the vertical spectra, which are expected to become steeper because of the presence of the layers and obey a form $E_h(k_v) \sim N^2 k_v^{-3}$. It would be interesting to add a plot with the evolution of the vertical spectra, for example of E^z_{xx}, during the early and intermediate times.

3. In §3.2 concerning the late time results, it is discussed that the flow enters a viscous-dominated regime and that the vertical lengthscale is expected to be $L_v \sim L_h Re^{-1/2}$, as proposed by Godoy-Diana et al. (2004). It could be interesting to plot L_v vs. t or $L_v Re^{1/2}/L_h$ vs. t and check that this relation is verified in the simulations at late times.

4. In the Conclusions and Discussion section the differences with 3 previous experimental studies which obtained different decay rates are discussed. It is suggested that the differences may be due to the initial conditions, which in DNS are HIT while in the experiments consist in a turbulent flow which has already been modified by the stratification before it becomes fully developed. While this may be a significant difference, I do not believe it is the most important one. In the case of the experiments of Praud et al. (2005) the main difference is most probably the Reynolds number since Re is low in their experiments. As mentioned in §3.2, this will probably have led to a decay associated with the viscous-dominated regime with a value of n close to that of isotropic turbulence, as seen in Figure 17. For this case, this appears to be a more plausible explanation for the discrepancy.

Minor revisions

** Typos:*

1. *'active parameter' (in the Abstract).* Corrected
2. *typo in definition of $\hat{N}$ (p.7).* **I don't see it**
3. *$t = 0$ should be $t = 1$ (caption of Table 1).* Corrected

4. *buoyancy flux expression should have no minus sign (end of p.15).* **True, but the minus is probably there because we are talking about k.e. We need to consider the wording of the sentence**

5. *definition of L_o (p.19), the factor should be of $(2\pi)^2$ (p.21).* **There was a typo in the definition, but I don't see why there should be a 2π.**

6. *it should be Fr_h/Fr_v (p.27).* Corrected

7. *the ratio should be $Rt_G/(15/4)$ (end of p.28).* **I don't understand**

** In the Introduction a hypothesis made by Davidson (2010) to arrive at (1.1) has been missed. It was assumed that $\epsilon \sim u_h^3/L_h$, in stratified turbulence. This should be stated in the Introduction.*

** The gray scale colour map makes it very difficult to understand the value of Gn in the images in Figure 2. Could a colour map with colours be used instead for clarity?*

Color doesn't make sense because the variable changes continuosly. Several reviewers are not convinced about this figure. I don't know how much the figure 2 adds beyond figure 1

** In §3.1.3 please give the definition of $\hat{u}_h$. A brief comment on the evolution of Fr_v and on $Fr_v \approx const$ for the final period of Figure 6 could be added.*

** Please give the definition of L_h in Equation (3.2) and which was used in Figure 12.*

L_h appears first in the 2nd paragraph of the intro.