Low bulk Richardson number in the tropical cyclone outflow layer **[POSTER]**

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We are examining the structure of the hurricane outflow layer using 2963 G-IV sondes. The locations of these sondes allows meaningful analysis only outside the 100 km radius. Winds averaged over 32 storms show maximum wind speed lies between the 800 and 900 km radii near the 13-km level. Wind field components are computed with respect to the ambient vertical wind shear. The vast majority of outflow is in the downshear half of the circulation. Upshear the mean flow is weak and inward over a broad region throughout the troposphere.

We have calculated bulk Richardson number (R_B) over 400-m layers. As expected, the maximum frequency of $R_B < 0.25$ and $R_B < 1$ occurs in the boundary layer, but a clear secondary maximum occurs in the upper troposphere, with the frequency increasing upward to the top of the G-IV layer. Fig 1 below shows the results. We are beginning to examine the reasons for this second low R_B layer, which must be turbulent when R_B falls below 0.25. It sometimes appears beneath cirrus layers and sometimes near the top of cirrus layers. In addition, the soundings show qualitative evidence for gravity waves with vertical wavelengths on the order of 1-2 km.

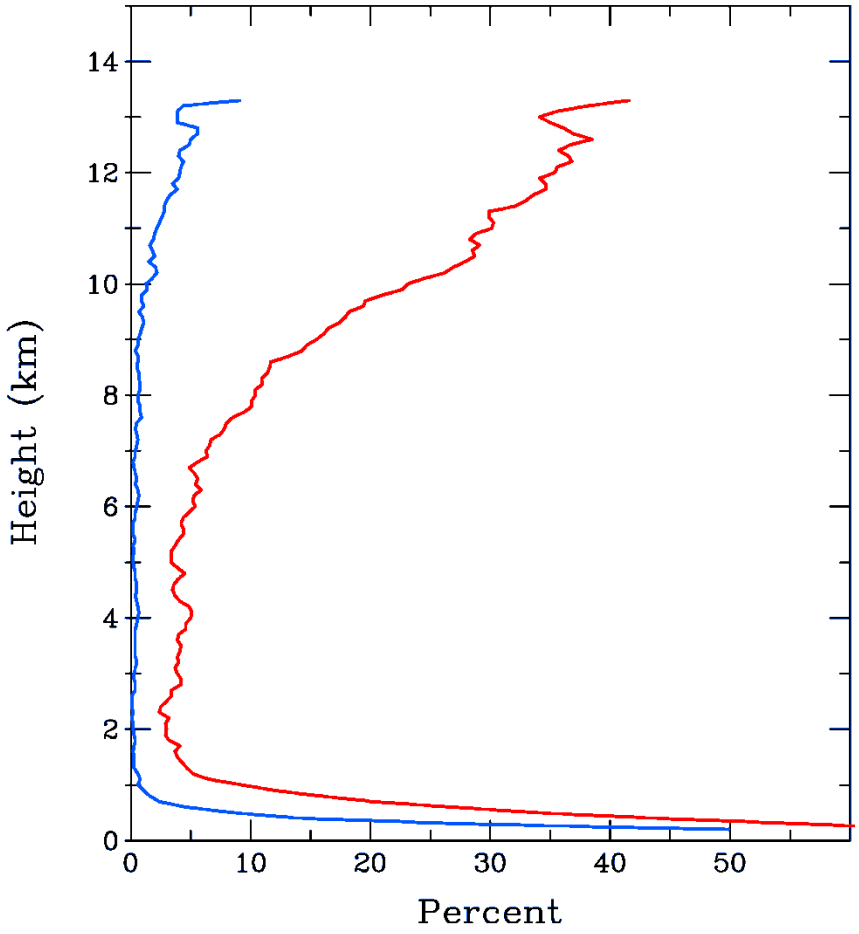

Figure 1. Frequency of $R_B < 0.25$ (cyan) and $R_B < 1$ (red) for all G-IV dropsondes within 1500 km of the storm center.

Our hypotheses for the vertical profiles of stability and shear are shown below. Several examples will be given in the poster at the conference.