Baroclinic Ekman spirals

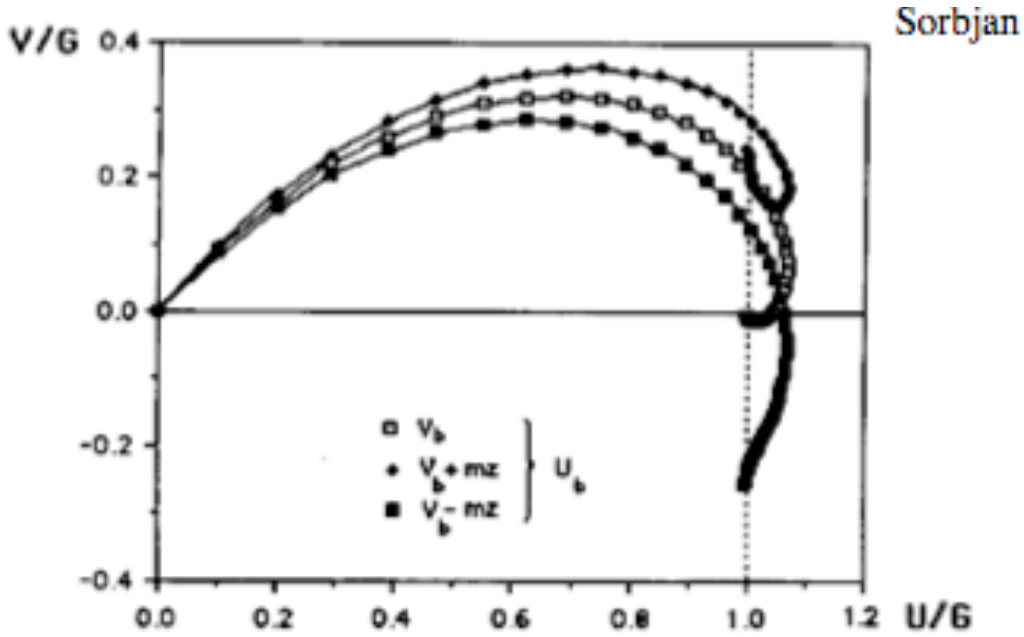
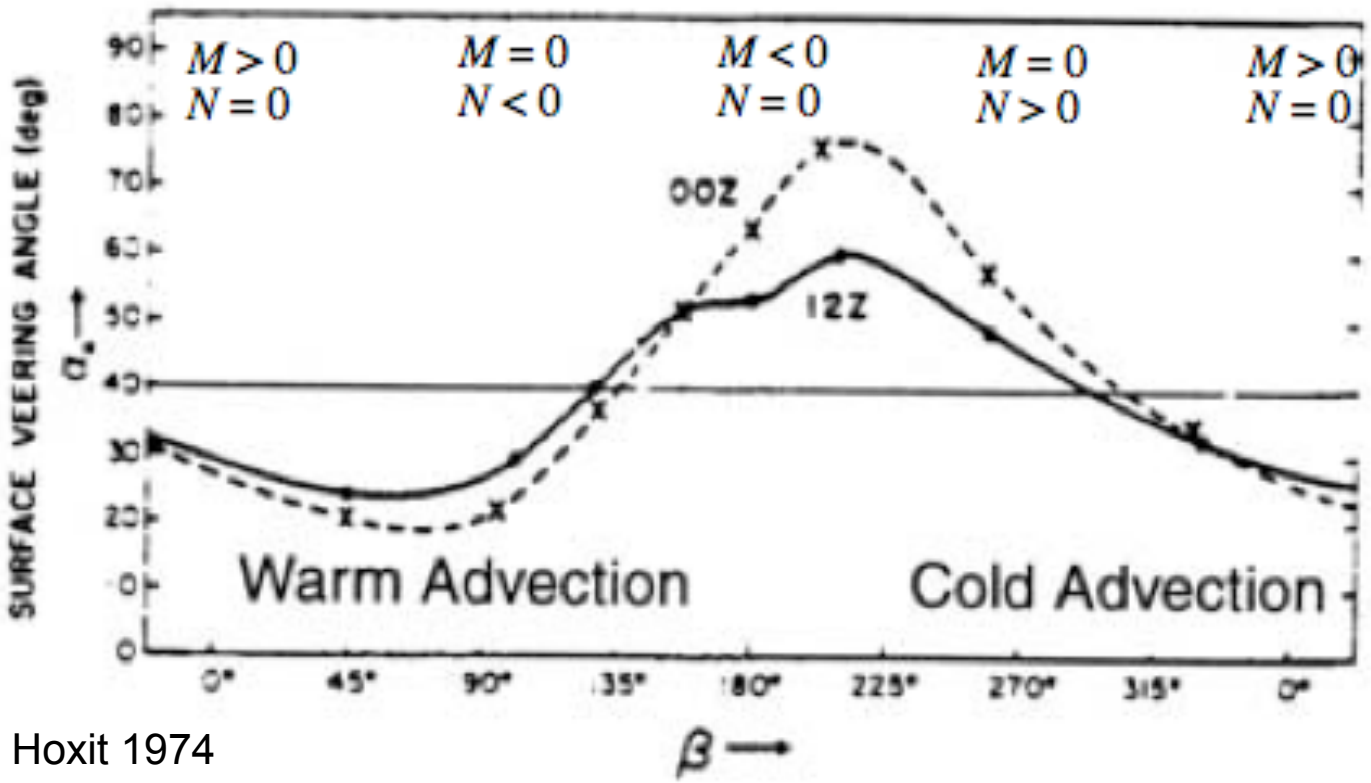
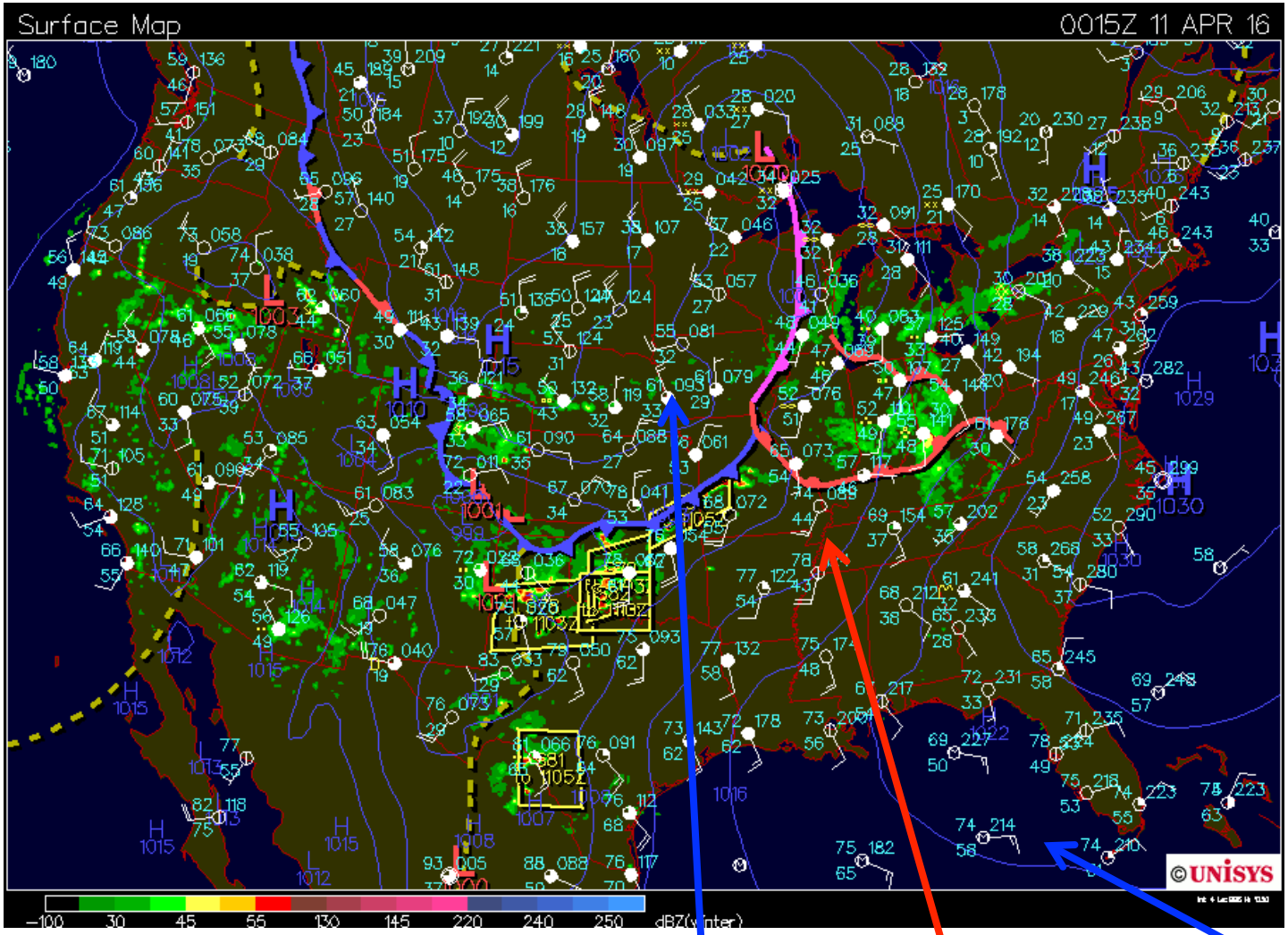


Figure 6.11 Ekman spirals obtained for the baroclinic correction of the V component of the wind velocity, $a = 0.001$, $m = 0.0001$. Points are plotted every 100 m, starting on the surface. U_b, V_b-barotropic components of the wind vector. Dotted line shows directions of the thermal wind vectors.

Surface wind crossing angle vs. thermal wind



Hoxit 1974

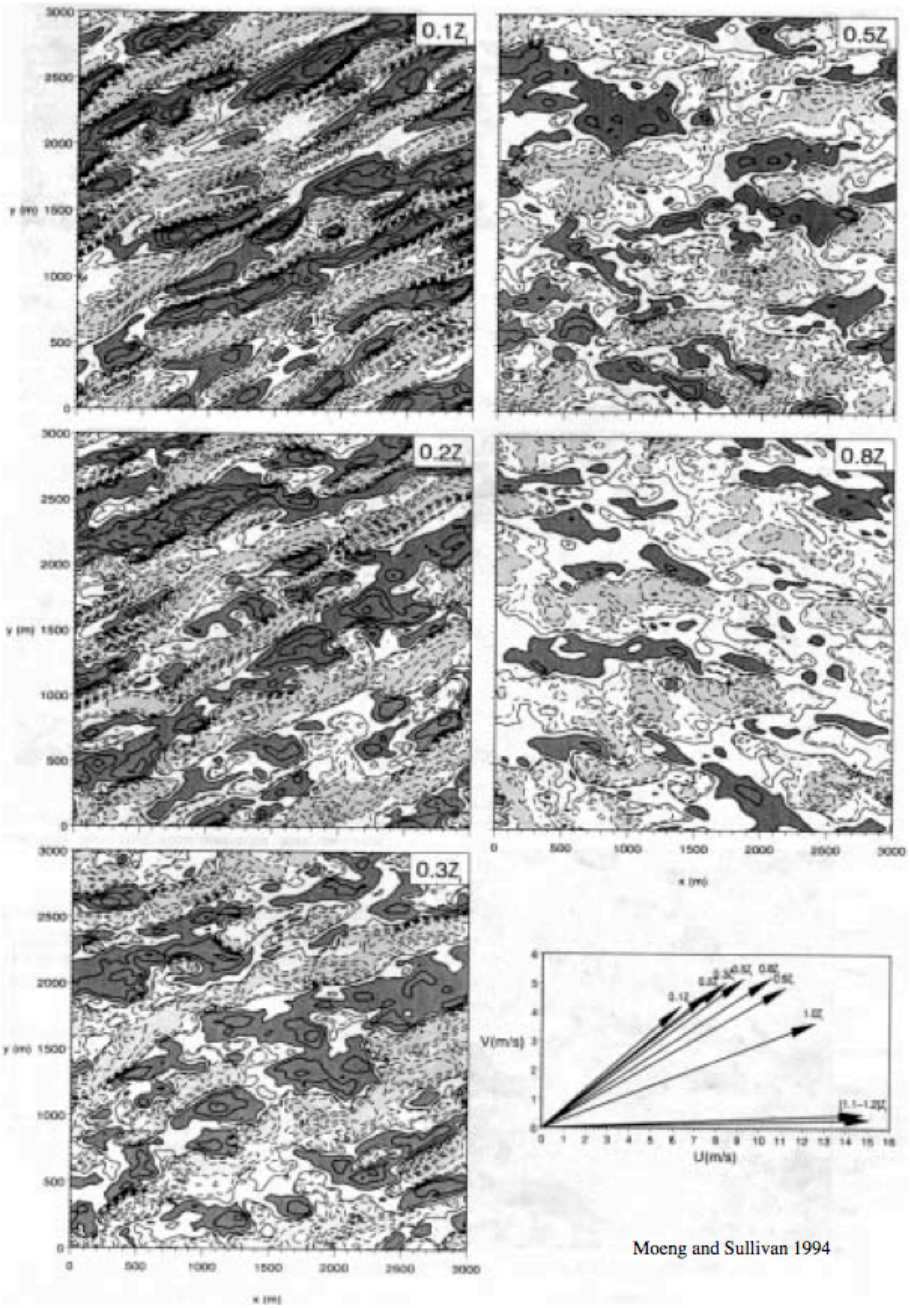


Cold advection:
cross-isobar flow

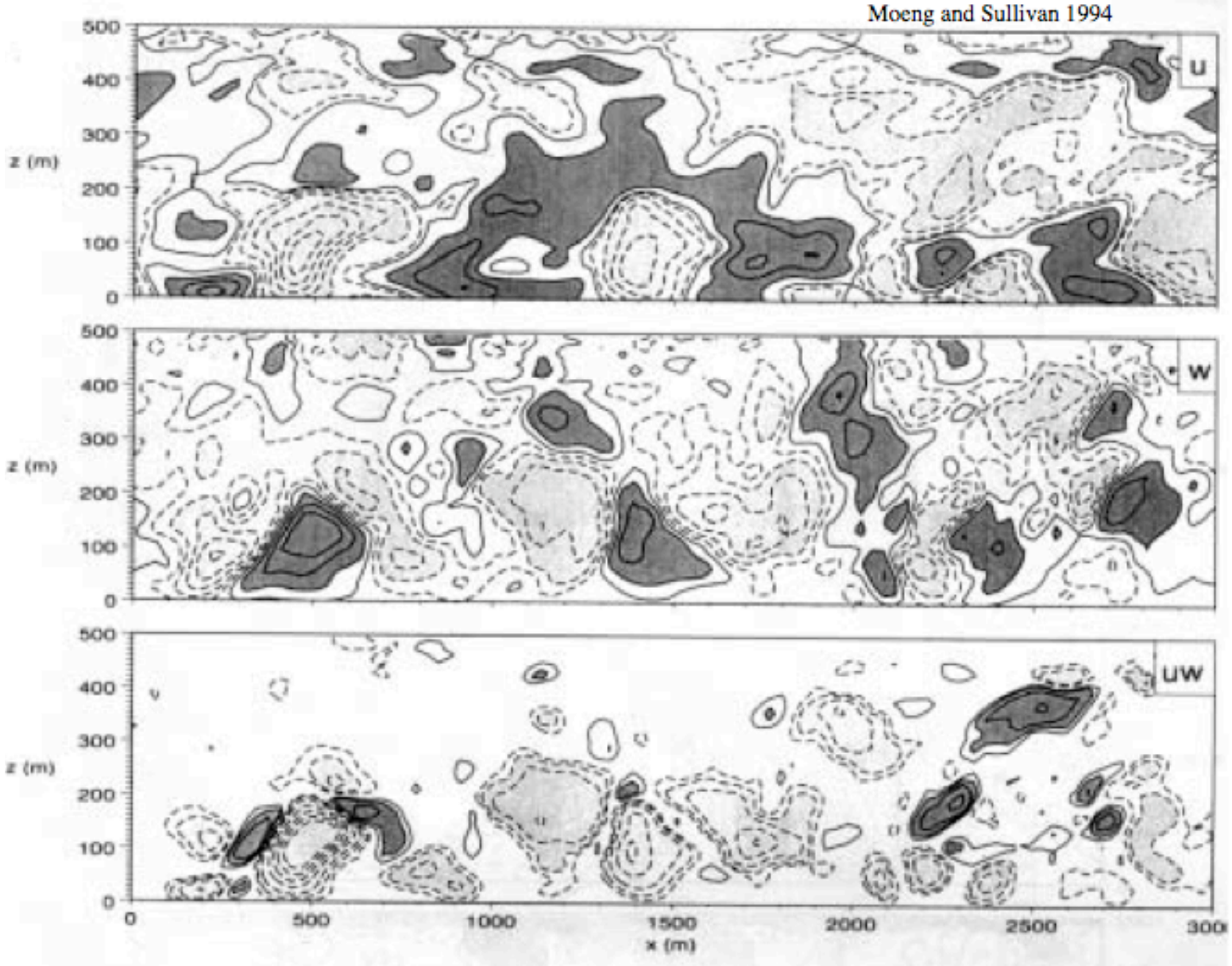
Warm advection:
Along-isobar flow

Over water:
along-isobar flow

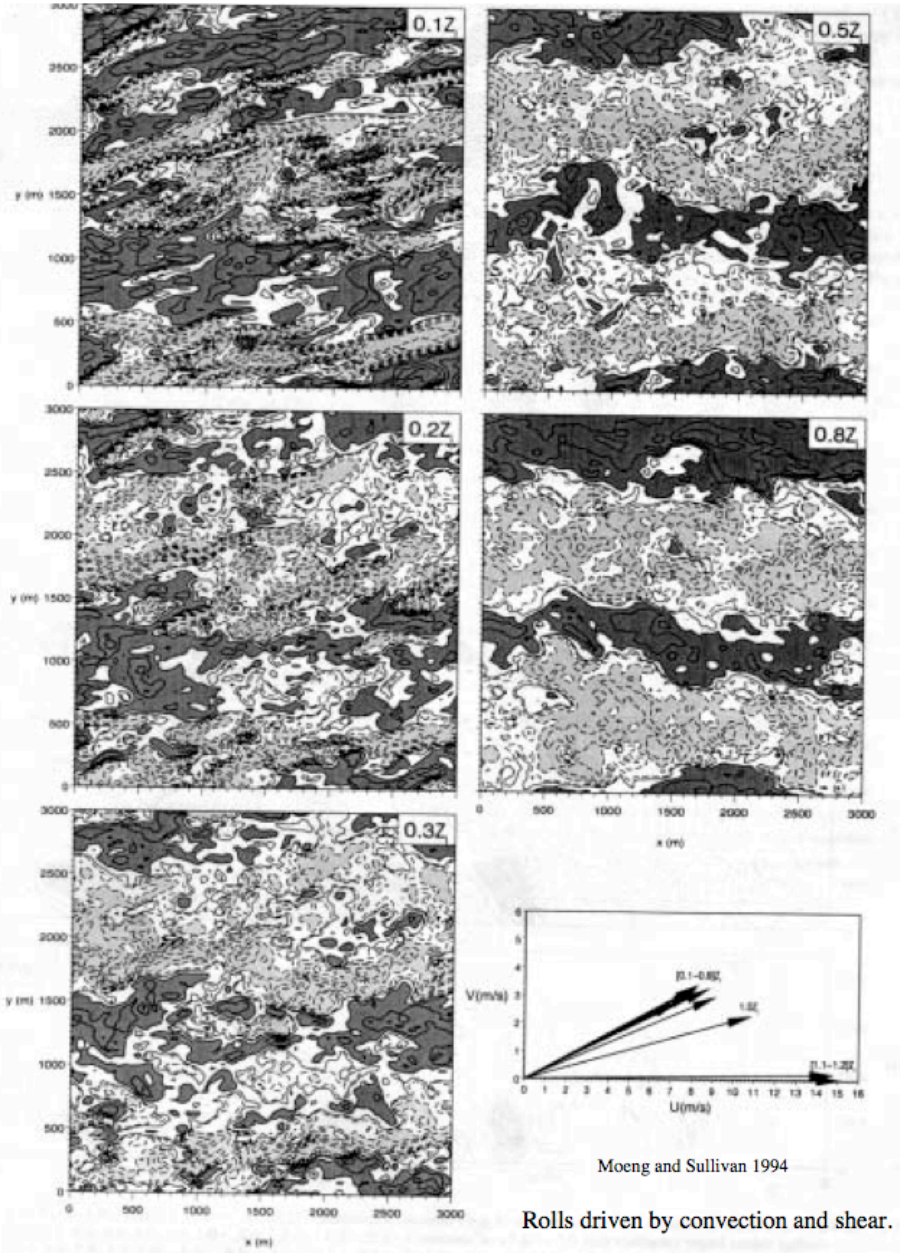
Horizontal sections of u’ from LES of shear-driven turbulence



LES vertical section of u’ in shear-driven PBL



Rolls in LES weakly convective PBL



Moeng and Sullivan 1994

Rolls driven by convection and shear.

FIG. 15. Views of x–y for simulation SB1 for u field at five height levels and its wind hodograph: contours (-3, -2.5, -2, -1.5, -1, -0.5, -0.1, 0.1, 0.5, 1, 1.5, 2), dark (light) shading values larger (smaller) than 0.5 (-0.5). Some height labels in the wind hodograph are grouped since winds at those levels are about the same.

Convective PBL (Rayleigh-Benard)

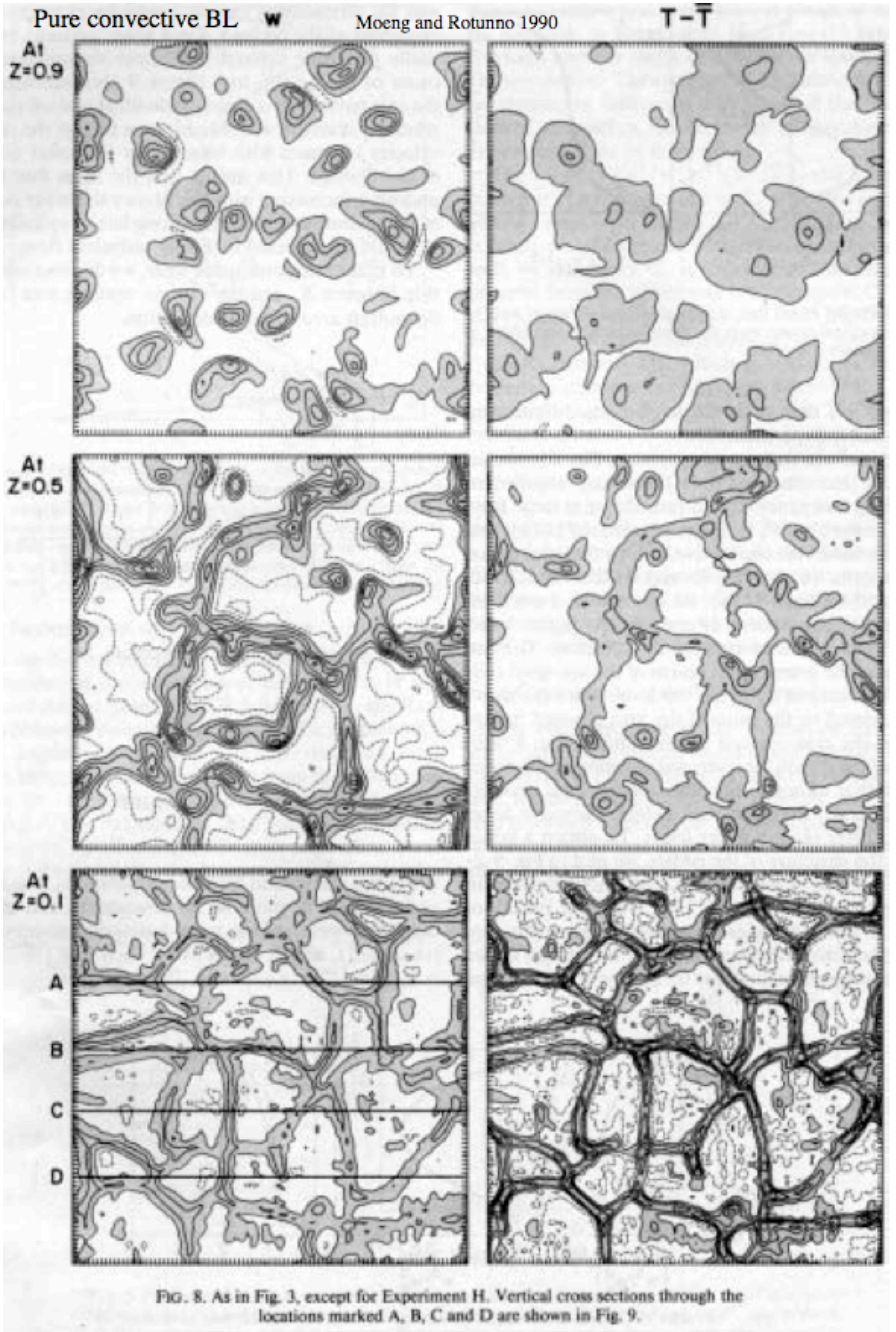


FIG. 8. As in Fig. 3, except for Experiment H. Vertical cross sections through the locations marked A, B, C and D are shown in Fig. 9.

Velocity variance profiles

Moeng and Sullivan 1994

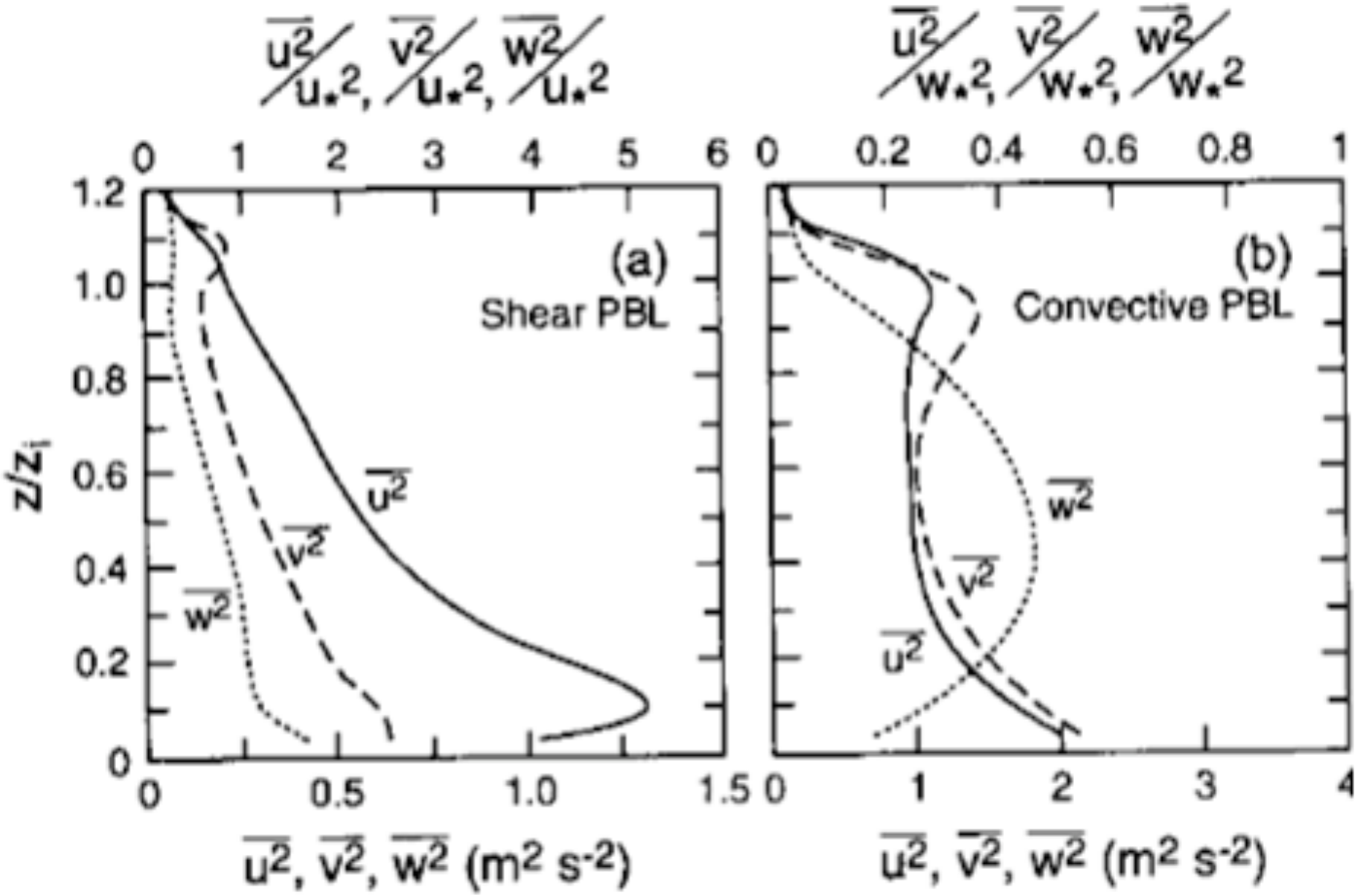


FIG. 9. Vertical distributions of the velocity variances of simulations S and B.

TKE budgets

Moeng and Sullivan 1994

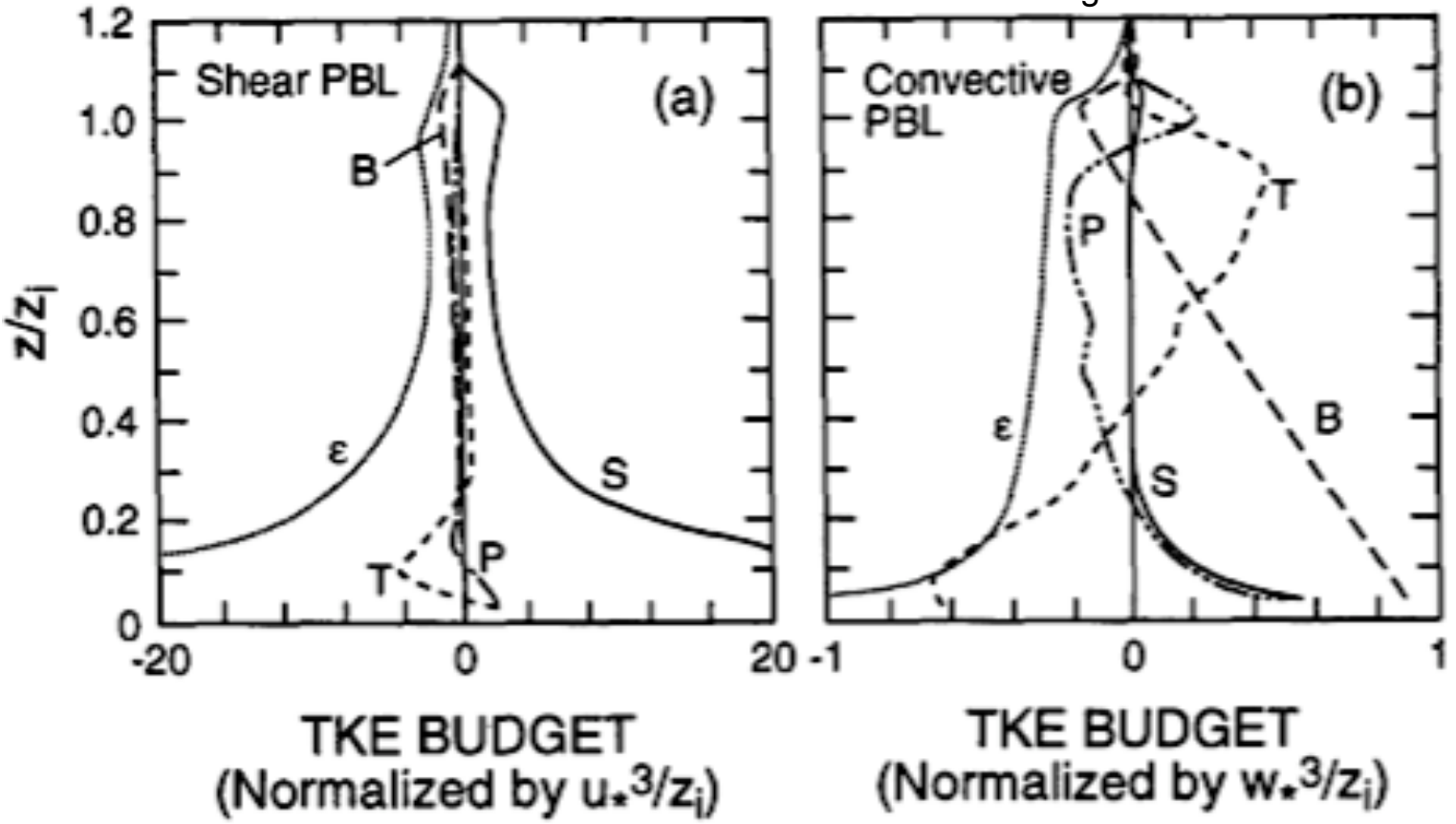
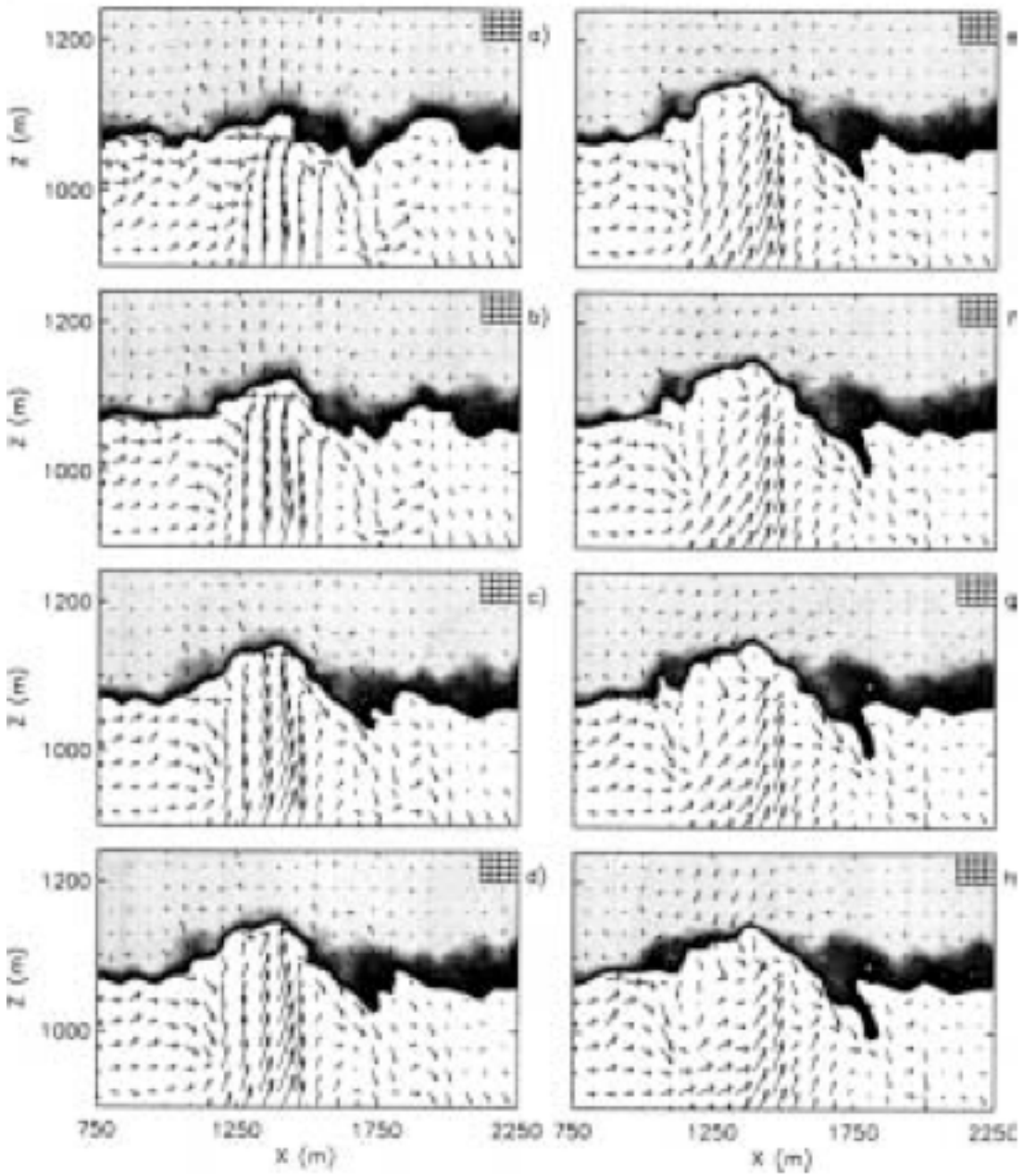


FIG. 11. Vertical distributions of the terms in the TKE budget computed directly from simulations S and B.

LES-simulated entrainment event in a convective PBL



Sullivan et al. 1998

Observational support for DCBL entrainment closure

$$\overline{w'b'}(h) = -0.2B_0$$

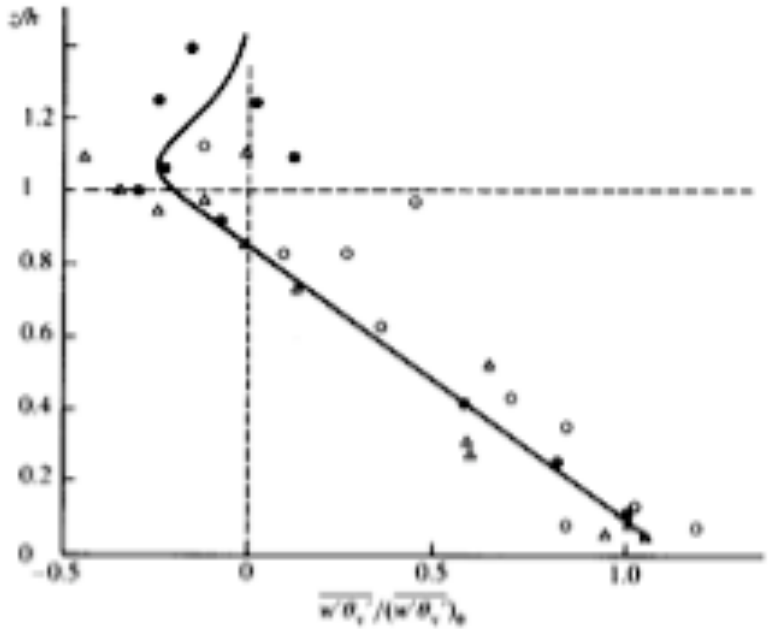


Fig. 6.2 Experimental data on the vertical variation of the virtual heat flux, normalized by its surface value; h is the depth of the mixed layer. Data are for three days from the 1983 ABL experiment; see Stull (1988, Figs. 3.1, 3.2 and 3.3). See also Fig. 6.23 of this volume.