$$\underset{\mathrm{I}}{\frac{z_i}{w_*^3}\frac{\partial \bar{e}}{\partial t}} = \underset{\mathrm{III}}{\frac{g\, z_i\left(\overline{w'\theta_v'}\right)}{w_*^3\,\overline{\theta_v}}} - \underset{\mathrm{IV}}{\frac{z_i\,\overline{u'w'}}{w_*^3}\frac{\partial \bar{U}}{\partial z}} - \underset{\mathrm{V}}{\frac{z_i}{w_*^3}\frac{\partial\left(\overline{w'e}\right)}{\partial z}} - \underset{\mathrm{VI}}{\frac{z_i}{w_*^3}\,\bar{\rho}\,\frac{\partial\left(\overline{w'p'}\right)}{\partial z}} - \underset{\mathrm{VII}}{\frac{z_i\,\varepsilon}{w_*^3}} \tag{5.2.3}$$

By definition, the dimensionless Term III is unity at the surface. Equations that are made dimensionless by dividing by scaling parameters are said to be ***normalized***. The normalization scheme expressed by (5.2.3) is used in most of the figures in this section, and indeed has been used in the previous chapter too.

As is evident in (4.3.1j), the buoyancy term acts only on the vertical component of TKE. Hence, this production term is ***anisotropic*** (i.e., not isotropic). The return-to-isotropy terms of (4.3.1h-j) are responsible for moving some of the vertical kinetic energy into the horizontal directions. Again, the anisotropic nature of Term III confirms our picture of strong up and downdrafts within thermals.

Consumption. In statically stable conditions, an air parcel displaced vertically by turbulence would experience a buoyancy force pushing it back towards its starting height. ***Static stability thereby tends to suppress, or consume, TKE***, and is

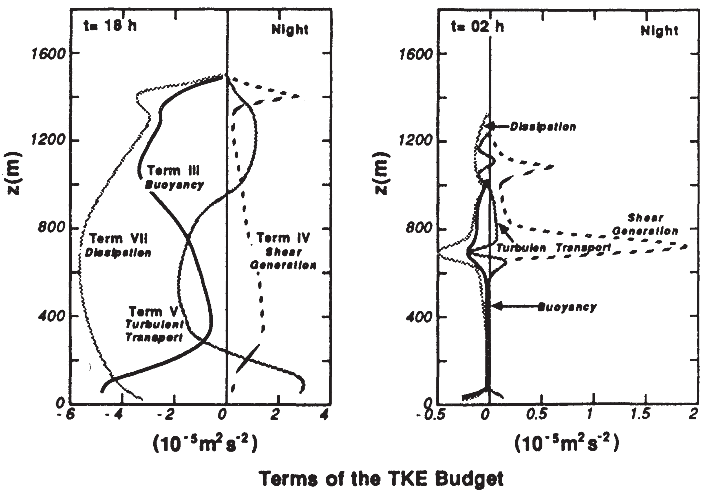

Fig. 5.6 Modeled turbulence kinetic energy budgets at t=18 h and t=02 h during Night 33-34, Wangara. After André et al. (1978).