FIGURE 5.1: Ellipsoidal coordinates. Top: View from the front.
Bottom: View from above.

whose axis coincides with the z-axis, and whose linear excentricity has the constant
value E. The coordinate u is the semiminor axis of this "coordinate ellipsoid", $\bar{\theta}$ is
the complement of the "reduced latitude" β of P with respect to this ellipsoid (for its
definition cf. sec. 1.4), and λ is the geocentric longitude in the usual sense.

The ellipsoidal coordinates u, $\bar{\theta}$, λ are related to x, y, z by the equations

$$
\begin{aligned}
x &= \sqrt{u^2 + E^2} \sin \bar{\theta} \cos \lambda \quad , \\
y &= \sqrt{u^2 + E^2} \sin \bar{\theta} \sin \lambda \quad , \\
z &= u \cos \bar{\theta} \quad ,
\end{aligned}
\tag{5-1}
$$

which can be read from the figure, considering that $\sqrt{u^2 + E^2}$ is the semimajor axis
of the ellipsoid whose surface passes through P.