in agreement with Fig. 8.11.

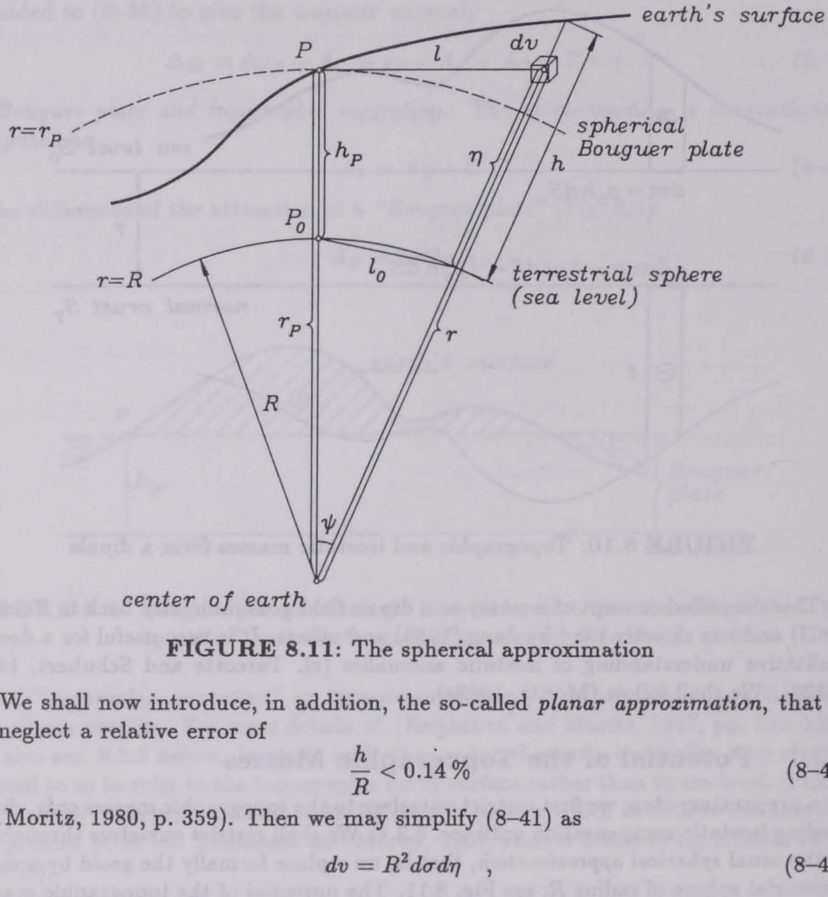

FIGURE 8.11: The spherical approximation

We shall now introduce, in addition, the so-called *planar approximation*, that is, we neglect a relative error of

$$\frac{h}{R} < 0.14\,\% \tag{8-43}$$

(cf. Moritz, 1980, p. 359). Then we may simplify (8–41) as

$$dv = R^2 d\sigma d\eta \ , \tag{8-44}$$

so that (8–40) becomes

$$V = G\rho R^2 \iint_\sigma \int_{\eta=0}^{h} \frac{d\sigma d\eta}{l} \ . \tag{8-45}$$

Here the integral with respect to σ denotes integration over the full solid angle, and

$$\eta = r - R \tag{8-46}$$

is the elevation of the volume element dv above sea level (represented by the sphere $r = R$).

We may now split up (8–45) as

$$V = V' + V'' \tag{8-47}$$