by (1–49). The result is (4–10) with

$$K_0(q) = \frac{4\pi G}{3} \int_0^q \rho(q) \frac{d}{dq} \left[A_0(q) q^3 \right] dq \quad ,$$
$$K_2(q) = \frac{4\pi G}{25} \int_0^q \rho(q) \frac{d}{dq} \left[B_2(q) q^5 \right] dq \quad , \tag{4–26}$$
$$K_4(q) = \frac{4\pi G}{63} \int_0^q \rho(q) \frac{d}{dq} \left[C_4(q) q^7 \right] dq \quad .$$

Here we have omitted the prime in the integration variable q' as we did before. The argument q of $K_i(q)$, of course, is identical with the upper limit of the integral (but not with the integration variable!).

4.1.3 Potential of Shell E_P

We now consider the potential of the "shell" E_P bounded by the surfaces S_P and S. We apply *the same trick* as before (sec. 4.1.1., Fig. 4.3). We calculate V_e first not at P, but at a point P_i situated on the radius vector of P in such a way that $r < r'$ is always satisfied and the series corresponding to (4–8),

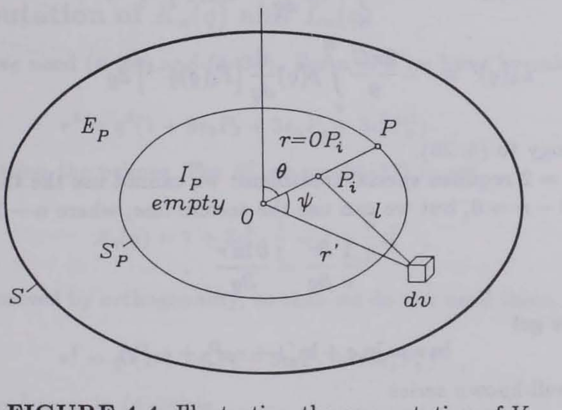

FIGURE 4.4: Illustrating the computation of V_e

$$\frac{1}{l} = \sum_{n=0}^{\infty} \frac{r^n}{r'^{n+1}} P_n(\cos\psi) \quad , \tag{4–27}$$

always converges (Fig. 4.4). For this "harmless" point we have

$$V_e(P_i) = G \iiint_{E_P} \frac{\rho}{l}\, dv = \sum_{n=0}^{\infty} r^n \cdot G \iiint_{E_P} \frac{\rho}{r'^{n+1}} P_n(\cos\psi) dv \quad , \tag{4–28}$$