where the "kernel" K, as far as dependence on θ, λ is concerned, is *isotropic*: it depends only on the spherical distance ψ', where

$$\cos\psi' = \cos\theta' \cos\theta'' + \sin\theta' \sin\theta'' \cos(\lambda'' - \lambda') \quad , \tag{8–117}$$

between the points (θ', λ') and (θ'', λ'') on the unit sphere (Fig. 8.14); the author

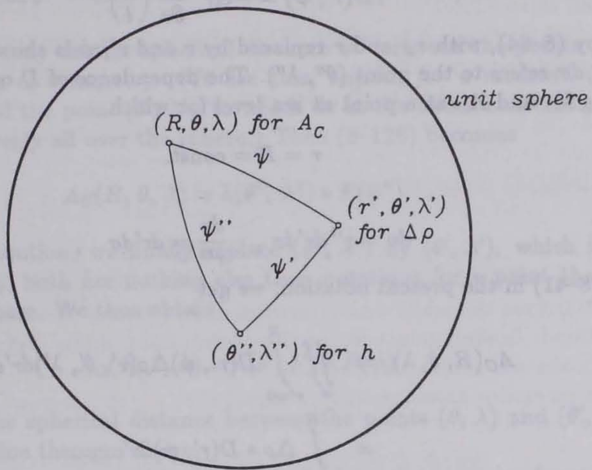

FIGURE 8.14: Various points on the sphere that play a role in the theory of Dorman and Lewis

apologizes for the clumsy notation with primes and double primes. Furthermore, K depends on depth through the radius vector r'. (The concept of "kernel" used here is, of course, completely different from that in sec. 7.2!)

Symbolically we may write the convolution (8–116) in a standard way as

$$\Delta\rho(r', \theta', \lambda') = h(\theta'', \lambda'') * K(r', \psi') \quad \text{or} \quad \Delta\rho = h * K \quad . \tag{8–118}$$

Eq. (8–116) is the exact spherical analogue of the familiar one-dimensional convolution on the line

$$f(x') = \int_{-\infty}^{\infty} h(x'')K(x' - x'')dx'' \quad \text{or} \quad f = h * K \quad ,$$

where $|x' - x''|$ denotes the distance between the points x' and x'' and thus corresponds to the spherical distance ψ'.

Now the potential of the compensating masses at a point (r, θ, λ) is represented by Newton's integral (1–1):

$$V_C(r, \theta, \lambda) = G \iiint_{earth} \frac{\Delta\rho(r', \theta', \lambda')}{l} \, dv \quad , \tag{8–119}$$