deviation $\Delta b_i(t^*) = b_i - B_i(t^*)$ into two components:

$$\Delta b_i(t^*) = \xi_i + r_i(t^*). \tag{1}$$

Let us call the value ξ_i the error of observation. It can be inspired by various causes but there is no reason to discuss them here. It is natural to suggest that ξ_i is a Gaussian random variable with zero mean value $E\xi_i = 0$, and with finite variation $d = E\xi_i^2 = 0$. We can call the component $r_i(t^*)$ an error due to the wrong determination of the ecliptic pole. The position of the ecliptic was known to ancient astronomers with some error which can be characterized by the two parameters γ and φ, see Fig. 114. From the definitions, it is easy to obtain that

$$r_i(t^*) = \gamma_i \sin\left(L_i(t^*) + \varphi_i\right) + \delta_i, \tag{2}$$

where $|\delta_i| < 1''$ if $|B_i(t^*)| < 80°$. Consequently, the value δ_i can be neglected in our calculations.

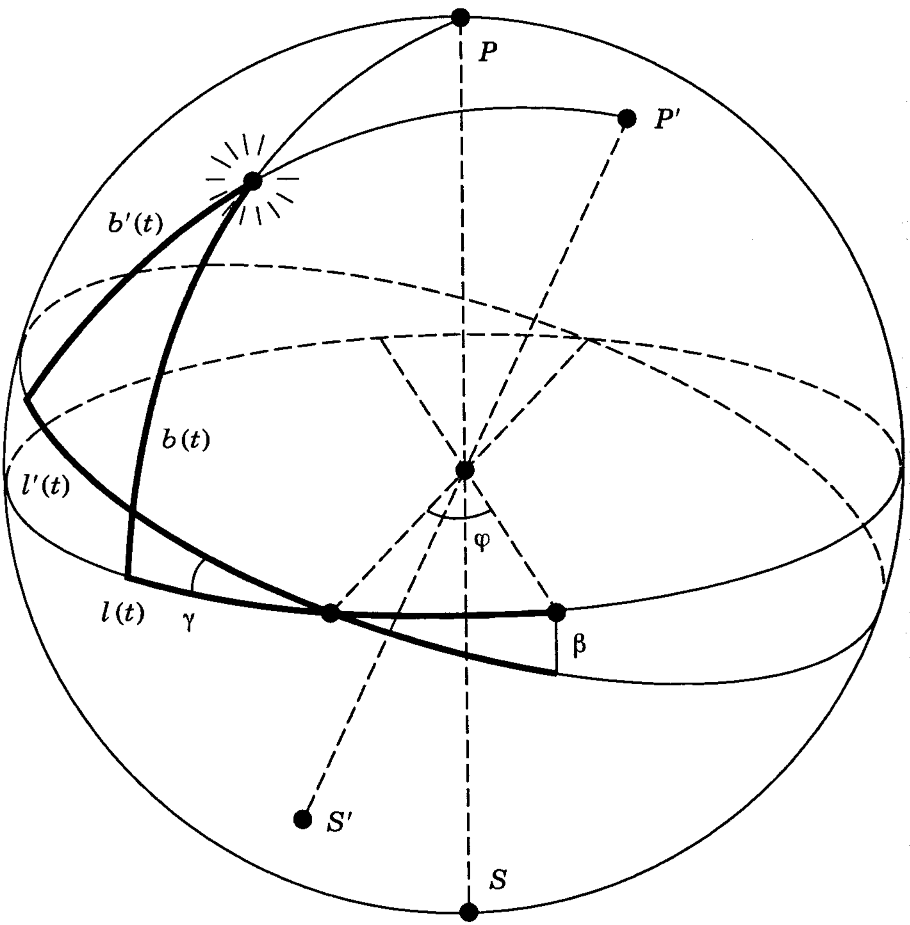

Figure 114. Geometrical representation of systematic errors in terms of spherical coordinates