The celestial sphere and the Sun's elliptical orbit as seen by a geocentric observer looking normal to the ecliptic showing the 6 angles (M, λ_p, α, ν, λ, E) needed for the calculation of the equation of time. For the sake of clarity the drawings are not to scale.

All these angles are shown in the figure on the right, which shows the celestial sphere and the Sun's elliptical orbit seen from the Earth (the same as the Earth's orbit seen from the Sun). In this figure ε is the obliquity, while $e = \sqrt{1-(b/a)^2}$ is the eccentricity of the ellipse.

Now given a value of $0 \leq M \leq 2\pi$, one can calculate $\alpha(M)$ by means of the following well-known procedure:[21]

First, given M, calculate E from Kepler's equation:[27]

$$M = E - e \sin E$$

Although this equation cannot be solved exactly in closed