Note 325(9a): Comparison of Einstein and Binet Forces

As in Note 325(9) the Einstein force is:

$$F(\text{Einstein}) = -\frac{mMG}{r^2} - \frac{3MGL^2}{mc^2 r^4} \quad -(1)$$

where:

$$\frac{1}{r} = \frac{1}{\alpha}\left(1+\epsilon\cos\theta\right) + \frac{\delta}{\alpha^2}\left(1+\frac{\epsilon^2}{2}+\epsilon\theta\sin\theta-\frac{\epsilon^2}{6}\cos 2\theta\right) \quad -(2)$$

and the Binet force is:

$$F(\text{Binet}) = -\frac{L^2}{mr^2}\left(\frac{d^2}{d\theta^2}\left(\frac{1}{r}\right)+\frac{1}{r}\right) \quad -(3)$$

$$= -\frac{L^2}{mr^2}\left(-\frac{\epsilon}{\alpha}\cos\theta+\frac{1}{r}+\frac{\delta}{\alpha^2}\left(2\cos\theta-\theta\sin\theta+\frac{2\epsilon^2}{3}\cos 2\theta\right)\right) \quad -(4)$$

It is clear that eq. (1) is not the same as eq. (4), so the method is refuted. The Einstein equation does not give the observed precession of the perihelion, it gives the orbit (2).