

periastron advance k :

$$k = \frac{1}{c^2} \frac{3}{j^2} \left\{ 1 + \frac{1}{c^2} \left[\frac{5}{4} (7 - 2\nu) \frac{1}{j^2} + \frac{1}{2} (5 - 2\nu) E \right] \right. \\ \left. + \frac{1}{c^4} \left[a_1(\nu) \frac{1}{j^4} + a_2(\nu) \frac{E}{j^2} + a_3(\nu) E^2 \right] \right\}$$

$$\frac{P}{2\pi GM} = \frac{1}{(-2E)^{3/2}} \left\{ 1 - \frac{1}{c^2} \frac{1}{4} (15 - \nu) E \right. \\ \left. + \frac{1}{c^4} \left[\frac{3}{2} (5 - 2\nu) \frac{(-2E)^{3/2}}{j} - \frac{3}{32} (35 + 30\nu + 3\nu^2) E^2 \right] \right. \\ \left. + \frac{1}{c^6} \left[a_2(\nu) \frac{(-2E)^{3/2}}{j^3} - 3a_3(\nu) \frac{(-2E)^{5/2}}{j} + a_4(\nu) E^3 \right] \right\}$$