

Dynamics in (r, φ, Υ) in (i, j, k)

- the associated parameters in terms of E, L, S, η and $\alpha = \angle(L, S)$:

$$a_r = -\frac{1}{2E} \left(1 - 2\chi_{so} \cos \alpha \frac{S E}{L c^2} \right),$$

$$e_r^2 = 1 + 2EL^2 + 8(1 + EL^2)\chi_{so} \cos \alpha \frac{S E}{L c^2},$$

$$n = (-2E)^{3/2},$$

$$e_t^2 = 1 + 2EL^2 + 4\chi_{so} \cos \alpha \frac{S E}{L c^2},$$

$$k = \frac{1}{c^2 L^2} \left(\chi_{so} - 3\chi_{so} \cos \alpha \frac{S}{L} \right),$$

$$e_\varphi^2 = 1 + 2EL^2 - 4(1 + 2EL^2)\chi_{so} \frac{E}{c^2} \\ + 4(3 + 4EL^2)\chi_{so} \cos \alpha \frac{S E}{L c^2}.$$