For $L = \sum_i m_i q_i \wedge v_i = 0$ but $\frac{dI}{dt} = \sum_i m_i q_i \cdot v_i \neq 0$ orbit, consider

$$\xi_i = \frac{q_i}{\sqrt{I}},\ \eta_i = \frac{d\xi_i}{dt} = \frac{v_i}{\sqrt{I}} - \frac{1}{2I}\frac{dI}{dt}\frac{q_i}{\sqrt{I}},\ \mu_i = m_i.$$

Then, we have

$$\sum_i \mu_i \xi_i = 0, \sum_i \mu_i \eta_i = 0, \sum_i \mu_i \xi_i \wedge \eta_i = 0, \sum_i \mu_i \xi_i \cdot \eta_i = 0.$$

$\therefore$ Triangle whose vertexes are $\xi_i = \dfrac{q_i}{\sqrt{I}}$ and

triangle whose perimeters are $\mu_i \eta_i = \mu_i \dfrac{d\xi_i}{dt}$ are always inversely similar.

(Synchronised Similar Triangles)