Therefore, we get

$$\frac{\xi_i \wedge \xi_j}{I(\xi)} + \frac{\eta_i \wedge \eta_j}{I(\eta)} = 0$$

where

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

That is

$$\frac{q_i \wedge q_j}{I} + \frac{v_i \wedge v_j}{K} = \frac{1}{2IK}\frac{dI}{dt}\frac{d}{dt}(q_i \wedge q_j)$$

where

$$I = \sum_i m_i q_i^2, \; K = \sum_i m_i v_i^2.$$