Notes for Lectures in Classical Mechanics *

Weiss Action Principle

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This principle is about characterizing the paths in terms of general variations of the action, when the end points may not be fixed. It states that the dynamical path C followed by the system is such that the variations about the path produce only end point contribution to the variation in action

$$\Delta\Phi[C] = \Delta \int_{t_1}^{t_2} L(q, \dot{q}, t)dt$$

$$= \sum_k \left(\frac{\partial L}{\partial \dot{q}_k}\right)\delta q_k - H\Delta t\Big|_{t_1}^{t_2}.$$

where

$$H = \sum_k \left(\frac{\partial L}{\partial \dot{q}_k}\right)\dot{q}_k - L \tag{1}$$

is called the Hamiltonian of the system. We skip the details of the steps leading to the Weiss action principle.

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