Notes for classical mechanics

John Kerl

February 3, 2008

Abstract

This is a crib sheet for mechanics. It is under construction.

Contents

1 Introduction

for now: exemplars of hamiltonians and lagrangians. particular coordinates?

- simple harmonic oscillator
- circular motion
- linear motion
- 3D motion with arbitrary V?
- electromagnetic
- what else?

action principle: $d\mathcal{L}/d\phi_i = 0$ where

$$\mathcal{L}[\phi_i] = \int L[\phi_i(s)]d^n s.$$

L is the Lagrangian; $\mathcal{L}$ is the action functional.

Why does $L = T - V$ work?

why is the ham the leg xform of the lagr?

bib: wiki article on lagr, lagr mech, ham mech.

References

[**Fra**] Frankel, T. *The Geometry of Physics: An Introduction* (2nd ed). Cambridge University Press, 2004.

Index