

308 notes 7.6-7.8

Tony Deng

November 9, 2021

This is a wild note

1 Generalized Momenta and Ignorable Coordinates

“In general, the generalized forces and momenta are not the same as the usual forces and momenta.” — Taylor, the master of saying nothing (of course they are not the same, otherwise we would call them the USUAL forces and momenta!).

2 Conclusion

3 More about Conservation Laws

3.1 Conservation of Total Momenta

3.2 Conservation of Energy

If we define the Hamiltonian as $\frac{d}{dt} \sum_{i=1}^n p_i \dot{q}_i - \mathcal{L}$, then wouldn't it always be 0? Or are we secretly defining $\mathcal{H} = \frac{d}{dt} \sum_{i=1}^n p_i \dot{q}_i - \mathcal{L} + \frac{d\mathcal{L}}{dt}$?

The proofs on translational invariance on both time and space are beautiful.