

PHYSICS 411-0 CLASSICAL MECHANICS

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Course Webpage: http://www.hep.anl.gov/ian/teaching/CM/CM_Winter10.html

ASSIGNMENT #5

Due at 2 PM, February 22nd

Reading Assignments:

Chapter 4 and Sections 5.1-5.5 of Goldstein's book.

Problem 1

Discuss the deflection direction of a particle moving on the surface of the earth with an initial velocity pointing to the south, west, up, and down, respectively.

Explain why on the satellite map a low-pressure weather system such as the hurricane always has a counterclockwise circulation of the air in the northern hemisphere.

Problem 2

(a) Compute the inertia tensor of a homogeneous cube of density ρ , mass M , and side of length b . Let one corner be at the origin, and let three adjacent edges lie along the coordinate axes.

(b) Compute the inertial tensor of the cube in (a) in a coordinate system with origin at the center of the mass of the cube.

Problem 3

Problem 4.21 in Goldstein's.

Problem 4

Problem 4.22 in Goldstein's.

Problem 5

Problem 5.3 in Goldstein's.

Problem 6

Problem 5.15 in Goldstein's.

Problem 7

Problem 5.19 in Goldstein's.