

# PHY422/820: Classical Mechanics

FS 2020

Exam Preparation

December 1, 2020

## Problem P10 – Moment of Inertia Tensor of an Ellipsoid

Consider a homogenous ellipsoid with mass  $M$  and semi-axes  $a, b, c$ , which can be parameterized as

$$\frac{x^2}{\alpha^2} + \frac{y^2}{\beta^2} + \frac{z^2}{\gamma^2} = R^2, \quad (1)$$

with  $a = \alpha R, b = \beta R, c = \gamma R$ .

1. Construct the mass density of the ellipsoid.
2. Compute the moment of inertia tensor.