Problem Set 5

Problem 1: Gravitational waves from Sco X1

Assuming that the accretion torque on Sco X1 is balanced by angular momentum loss by gravitational radiation, obtain the expression for the amplitude of the gravitational radiation given in the notes.

Problem 2: Gravitational waves from core collapse

Derive an expression for the gravitational waves produced by the collapse of a degenerate stellar core assuming that there is some small eccentricity e of the core that grows as the core radius shrinks according to $e \propto R^{-1/2}$ (as it would if the core were rotating).