

Physics 106b
Problem set number 3
Due Wednesday, January 27, 1999

Notes about course:

- Note that there is a “Ph106” box in room 335, which can be used for submitting homework sets.
- TAs:
Yi Li lym@its.caltech.edu
Chiyan Luo chiyan@cco.caltech.edu
Federico Spedalieri federico@cco.caltech.edu
- Web page URL:
<http://www.cithec.caltech.edu/~fcp/ph106/>

Reading: Goldstein chapter 10, sections 1 through 5.

10. A beam of electrons is directed along the z axis. Initially they are uniformly distributed in physical space, covering a circular cross section of radius R_0 . The z -components of momentum are distributed according to a Gaussian, while the x - and y -components of momentum are uniformly distributed between 0 and maximum magnitude P_0 . The beam is focussed by a lens system, which does not affect the z -component of momentum (to a good approximation), to a circular spot of radius R_1 . What is the momentum distribution at the focal point?
11. Goldstein problem 9-33.
12. Goldstein problem 9-39.
13. Goldstein problem 10-3.
14. Goldstein problem 10-13.