

PHYS 402: Electricity & Magnetism II
Due date: Tuesday, November 26, 2013

Problem set #9

Griffiths 3rd Ed. [4th Ed.] problems
11.14 [11.14], 11.17 [11.17], 11.23 [11.25], 12.7 [12.7], 12.8 [12.8]

Poisson's shadow

A laser beam of wavelength λ and a very large diameter is incident (normal) on a screen that contains a hole that is small enough that the intensity of the laser, I_0 , over the hole is constant. If d is the diameter of the hole, then find the on axis intensity of the light as function of distance from the hole $I(z)$. You will need to approximate the integrand of the Kirchoff integral. You may do the calculation in either the Fresnel limit or the Fraunhofer limit.

