Problem Set 2023-6
Physics 265
First Semester, AY 2023– 2024
Release Date: 22 September 2023
Due: 6 January 2024
Ten points per number

1. Interference Signal Produced By Mercury Light Source. The visible light that is produced by an Hg lamp consists of the following spectral lines (nm) and their relative intensities (I): 312 (I = 70), 334 (46), 365 (96.7), 405 (73), 436 (93.3), 546 (80), and 579 (53).

Plot the total interference signal (Equation 15, Section 7.2, Born & Wolf)that is produced by an Hg lamp within the optical path difference range:
$-1.5 \leq \Delta S$ (micron) ≤ 1.5.

2. Interference Signal Produced By Sodium Light Source. The visible light that is produced by a Sodium lamp consists of two (doublet) lines: 589.6 nm (I = 70), and 589 nm (70).

Plot the total interference signal that is produced by Na lamp within the optical path difference range: $-1.5 \leq \Delta S$ (micron) ≤ 1.5.

3. Which light source (Hg or Na) produces an interference signal with higher visibility V where $V = (I_{max} - I_{min})/ (I_{max} + I_{min})$?

END.