Problem 1.1

Using $\hbar = 1.05 \times 10^{-34}$ joules, $k = 1.38 \times 10^{-23}$ joule/K and $T = 280\,\mathrm{K}$, find the spin excess as a fraction of N for protions at 0.35 tesla.

Problem 1.2

Find the frequency and free-space wavelength associated with the rf field required for proton magnetic resonance at each of the different B_0 values of a) 0.08 T, b) 0.4 T, c) 1.6 T, and d) 8 T.

The problems are based on those in Robert W. Brown, Y.-C. Norman Cheng, E. Mark Haacke, Michael R. Thompson, Ramesh Venkatesan. *Magnetic Resonance Imaging: Physical Principles and Sequence Design*, 2nd Edition, Wiley, 2014.