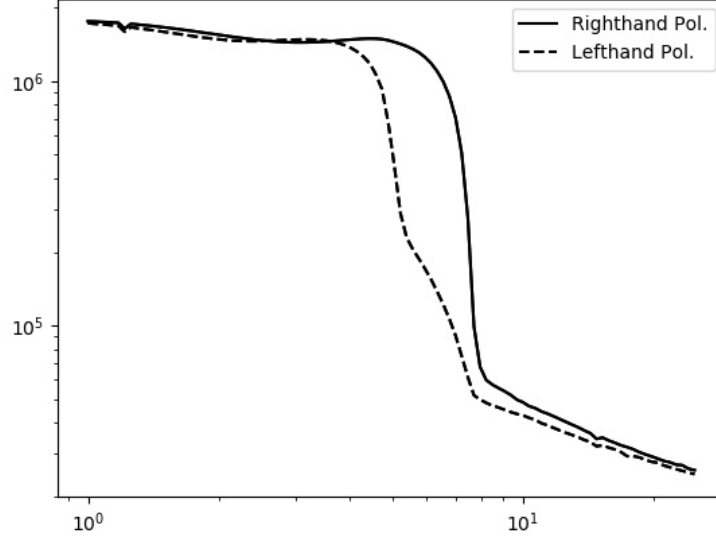


Homework Set 10 - PHYS 728 Radio Astronomy

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Problem 10.1-Solution:



The coronal temperature measured at the top of the graph is 1.76 MK. The polarity is positive except for a small frequency range. The two most rapid falloffs were at 4.9 GHz and 7.3 GHz, which gives the approximate ratio of 2:3. Utilizing the equation

$$B = \frac{\nu_B}{2.8 * 10^6} \quad (1)$$

and that the fundamental harmonic is 2.5 GHz, we find that the field strength is approximately 892.9 Gauss. This is valid over the temperature range of .25-1 MK.

Problem 10.2-Solution:

To show the equations follow, start with 6.27

$$P = \frac{n(2.8e10)B_l}{\nu} \quad (2)$$

using $c = \lambda\nu$, and rearranging

$$B_l = \frac{Pc}{n\lambda 2.8e6} \quad (3)$$

after cancelling, we get

$$B_l = \frac{107.14P}{n\lambda} \quad (4)$$

The degree of polarization at 10 GHz was measured to be approximately .062, or 6.2 percent. The average slope of the two lines was -71350. The longitudinal

B-field is approximately 110.7 Gauss, giving an angle between the field and line-of-sight of 82.9 degrees.