

Physics 425, Spring 2012:

Assignment set #15

Due April 25:

40. Consider two charged lines with equal but opposite line charge densities $\pm\lambda_0$ in their rest frames. The lines are parallel to x-axis, and are slightly separated so that they can move independently.

(a) Suppose the lines move in the lab frame with equal but opposite velocities $\pm\frac{v}{2}\hat{x}$, respectively. What are the electric field and magnetic field by the lines measured in the lab frame?

(b) Suppose that the positive line is at rest in the lab frame, and the negative line moves in the lab with the velocity $-v\hat{x}$. What are the electric field and magnetic field measured in the lab frame?

Due April 27:

41. Griffiths Problem 12.54