Due date: Tuesday, Nov. 22.

Griffiths reading: 4.3 and 4.4.1. Not responsible for 4.4.2-4. But now go back and read the parts of 1.1.1-3 and 1.2.5-7 having to do with cross products and curls.

Note: Our next class is on Tuesday Nov. 22 at 1:40pm in SEC208 (we follow Thursday class schedules that day). There is no class on Wednesday Nov. 23.


3. [4 points] Refering to Fig. 4.25(b), let’s say that the total area of each plate is $A$, the separation between the plates is $d$, a material of dielectric constant $\epsilon_{r1}$ fills half the region between the plates, and a material of dielectric constant $\epsilon_{r2}$ fills the other half. (The figure is drawn for the case where the second material is air or vacuum, $\epsilon_{r2}=1$, but let’s do it for general $\epsilon_{r2}$.) Solve for the capacitance of this structure.


5. [2 points] Prove formulas (1.44) and (1.46) in Griffiths 1.2.7 (curl of gradient and divergence of curl are always zero).

6. [2 points] Prove product rule (iv) on p. 21:

$$\nabla \cdot (A \times B) = B \cdot (\nabla \times A) - A \cdot (\nabla \times B)$$