The space between the spaces of a parallel plate capacitor is filled with two slabs of linear dielectric material. The slabs have different dielectric constants but the same length L, width W and thickness d. (note the area of the top (or bottom) of the capacitor is 2\*L\*W). Slab 1 has a dielectric constant of e1=2 and slab 2 has a dielectric constant of e2=1.5. The voltage on the top plate is Vo and the bottom plate is grounded.

1. What is the electric Field E in each Slab
2. What is the Dielectric displacement D in each slab
3. What is the polarization P in each slab
4. What is the magnitude of Sf, the free surface charge adjacent to each slab
5. What is the magnitude of Sb, the bound surface charge density in each slab
6. What is the magnitude of Vb, bound volume charge density in each slab
7. What is the capacitance of the system and how does it compare to the capacitance of the system with no dielectrics.

d

Vo

W

W

X

Slab 2

Slab 1