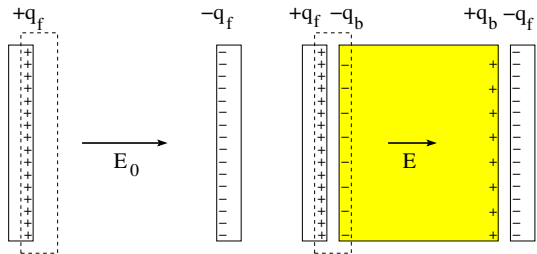


# Parallel-Plate Capacitor with Dielectric (1)



The polarization produces a bound charge on the surface of the dielectric.



The bound surface charge has the effect of reducing the electric field between the plates from  $\vec{E}_0$  to  $\vec{E}$ .

- $A$ : area of plates
- $d$ : separation between plates
- $\pm q_f$ : free charge on plate
- $\pm q_b$ : bound charge on surface of dielectric
- $\vec{E}_0$ : electric field in vacuum
- $\vec{E}$ : electric field in dielectric