Parallel Plate Capacitor: Potential Difference
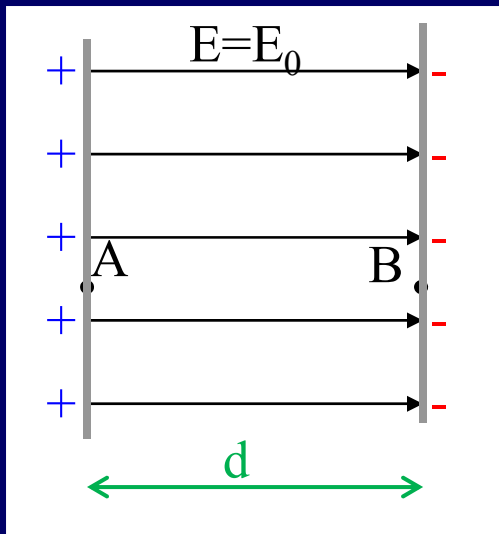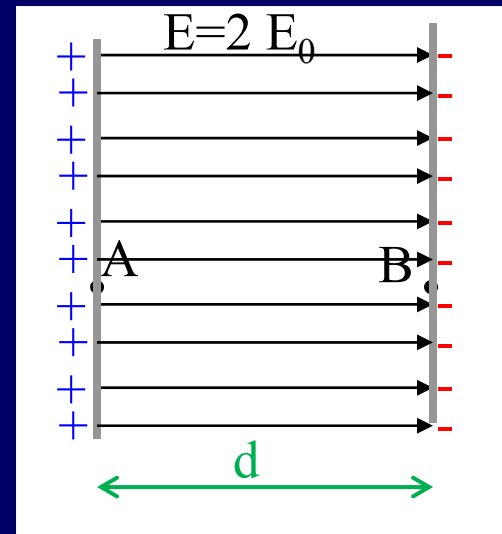
Charge Q on plates

$V = V_A - V_B = +E_0 d$

Charge 2Q on plates

$V = V_A - V_B = +2E_0 d$

Potential difference is proportional to charge: Double Q → Double V

$E_0 = 4\pi k Q / A$