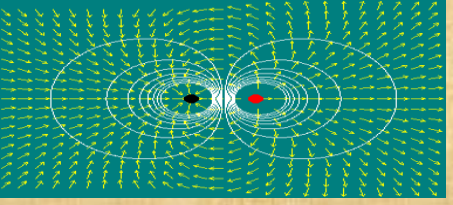
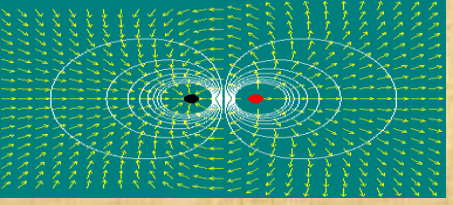


CAMPO ELÉTRICO

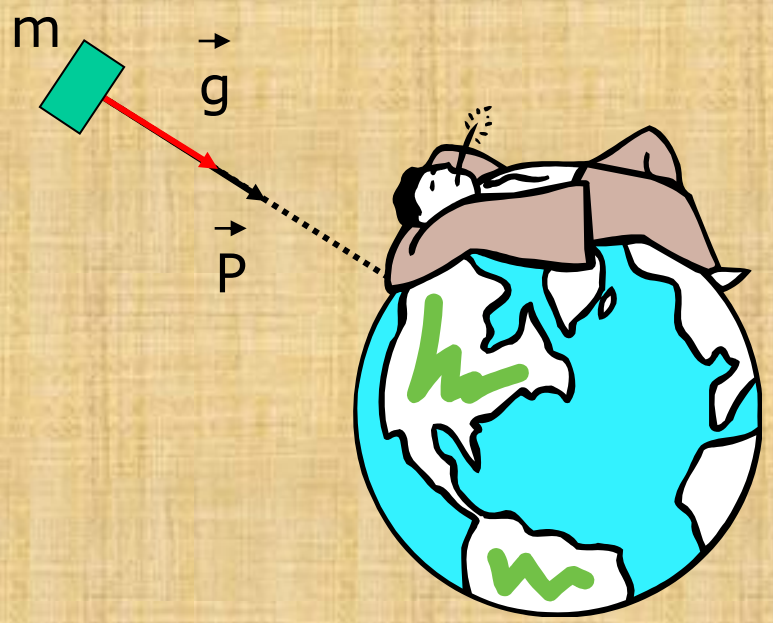
Ana Barros

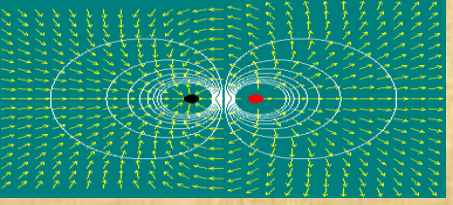


CAMPO

Campos mais Importantes
- Campo Elétrico
- Campo Magnético
- Campo Gravitacional

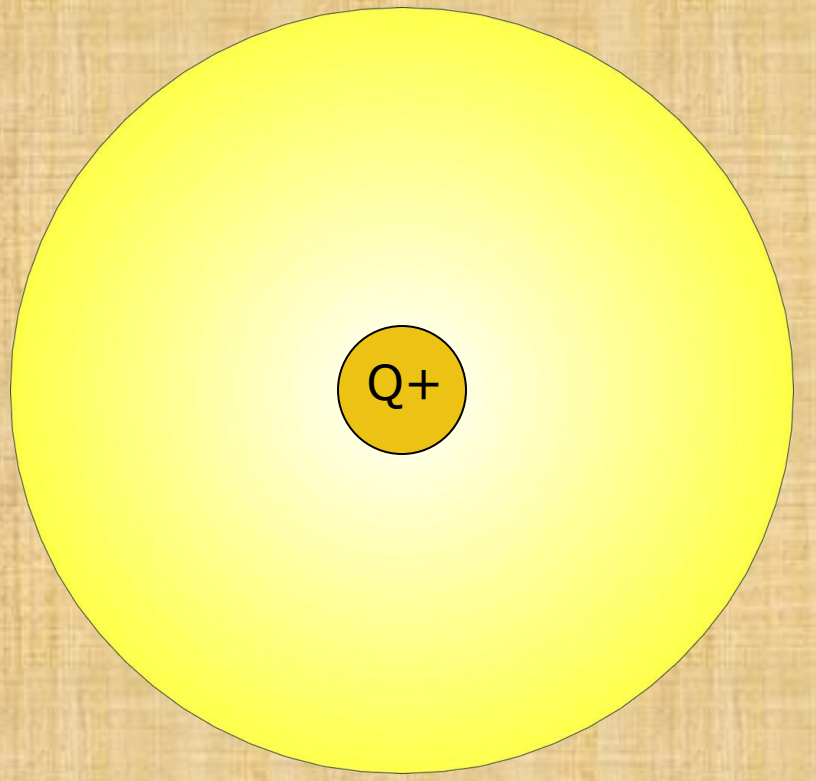
$$\vec{g} = \frac{\vec{P}}{m}$$

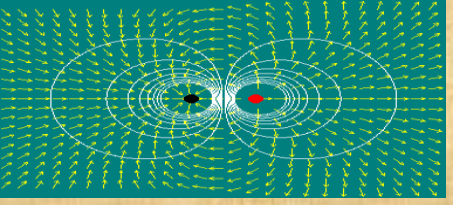




Conceito

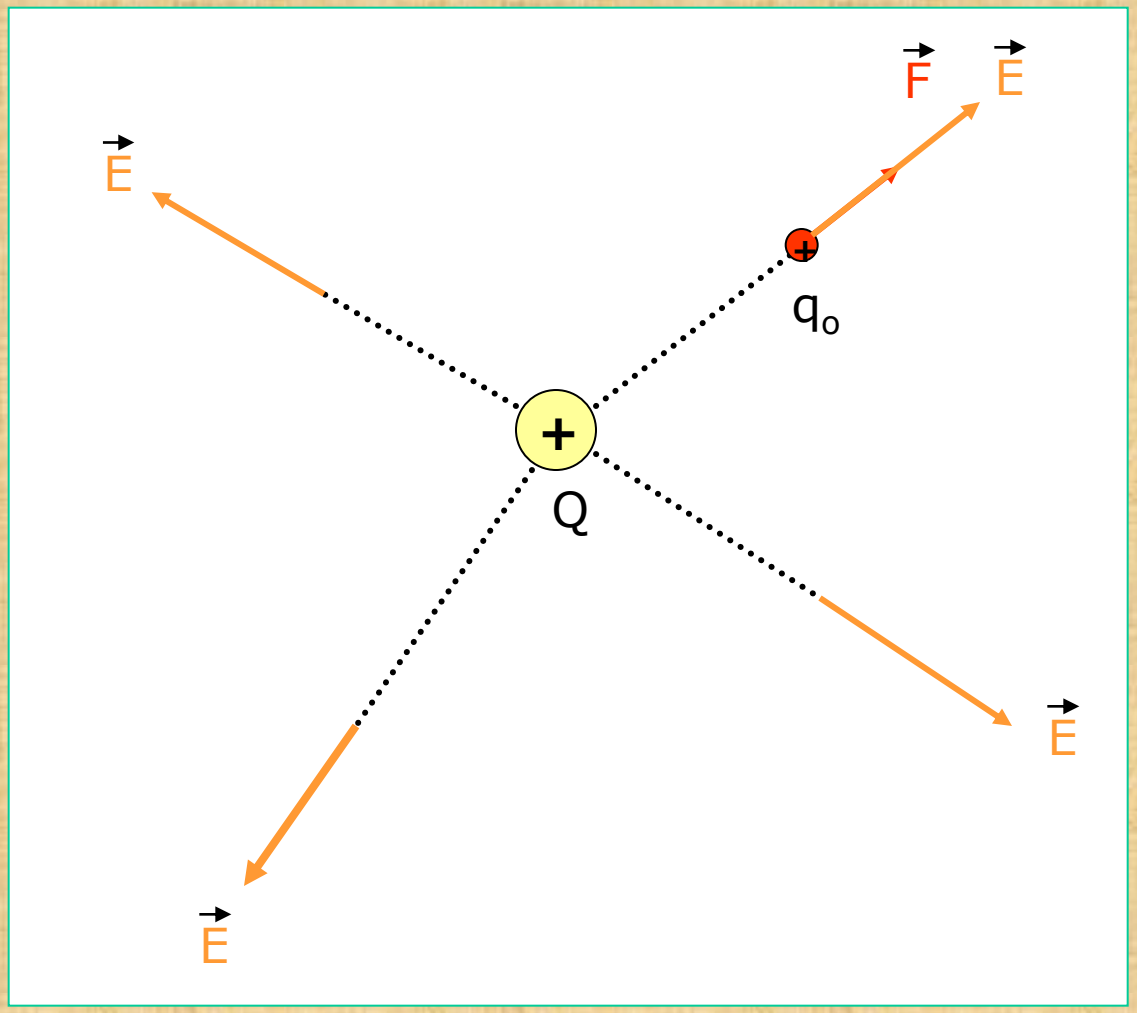
Uma Carga Elétrica influi no espaço ao seu redor.



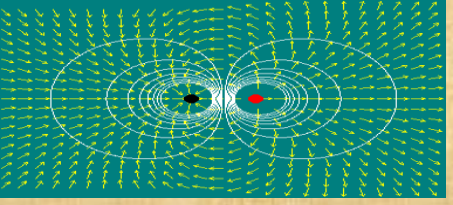


Campo Elétrico

Gerado por uma carga positiva

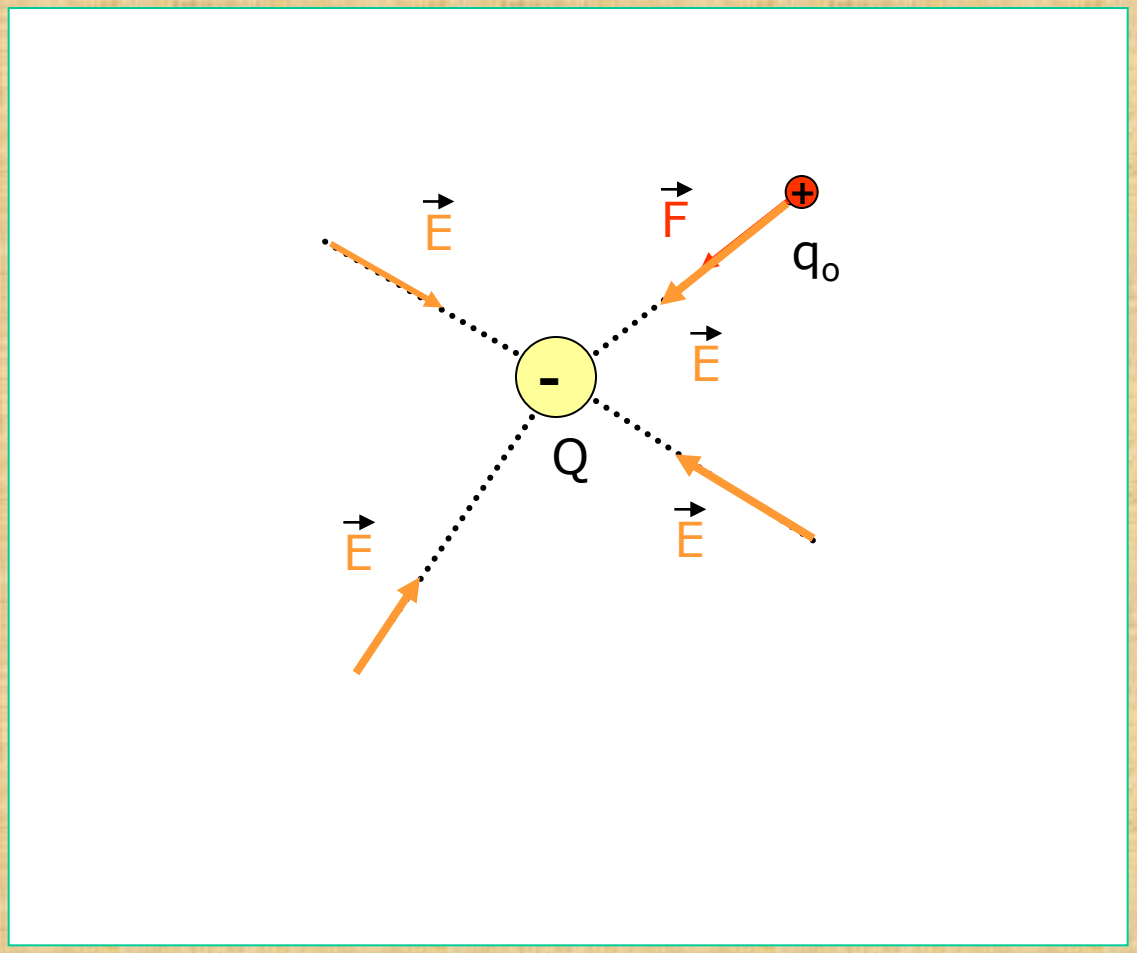


$$\vec{E} = \frac{\vec{F}}{q_o}$$

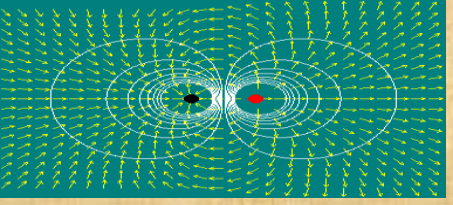


Campo Elétrico

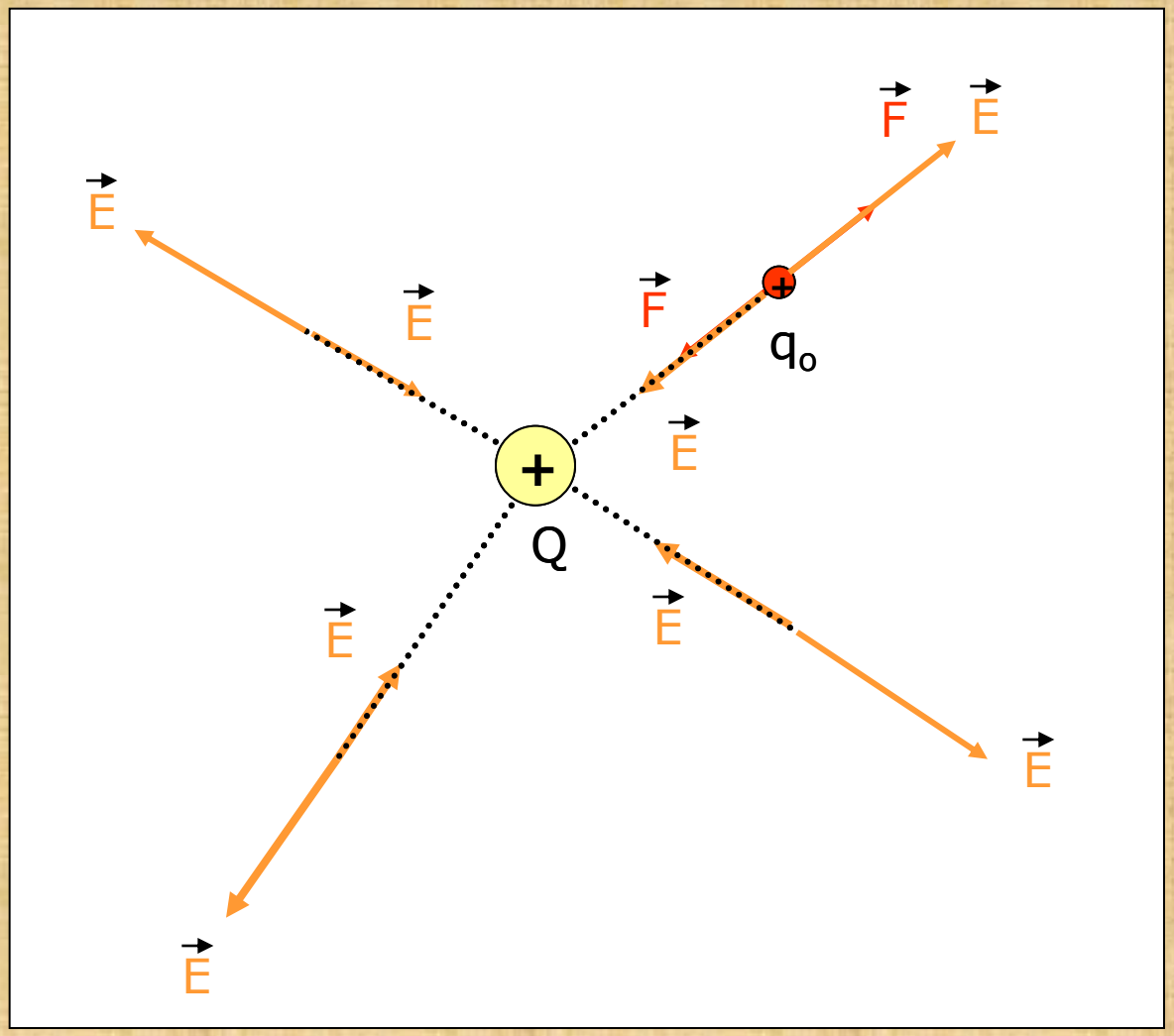
Gerado por uma carga negativa



$$\vec{E} = \frac{\vec{F}}{q_o}$$



Conclusão Importante



Carga Positiva

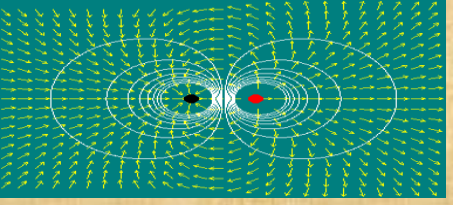
⇩

Campo Divergente

Carga Negativa

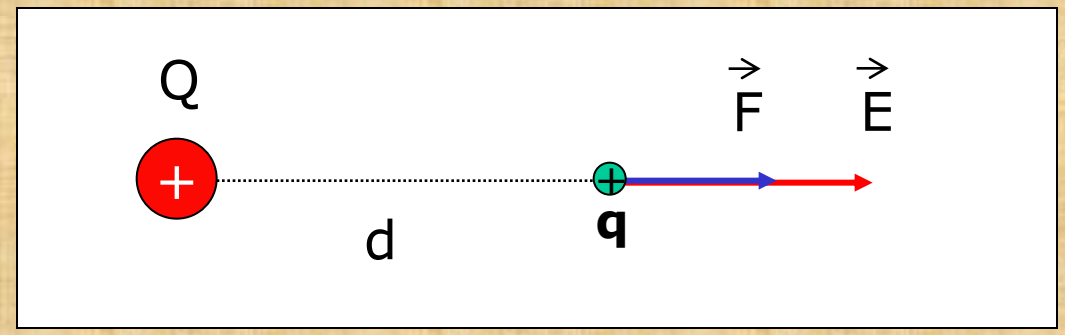
⇩

Campo Convergente



Cálculo do Campo Elétrico

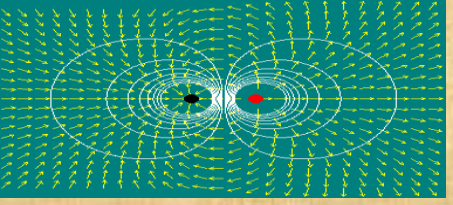
$$\vec{E} = \frac{\vec{F}}{q}$$



$$E = \frac{F}{q}$$

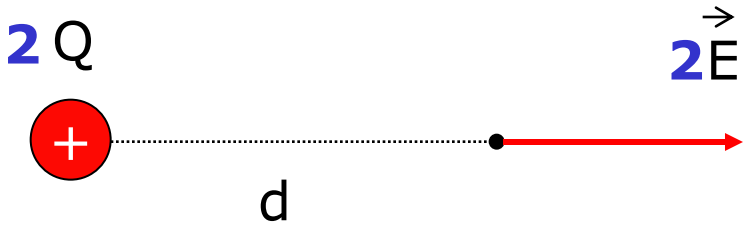
$$E = \frac{k\dfrac{Q.q}{d^2}}{q}$$

$$E = k\frac{Q}{d^2}$$



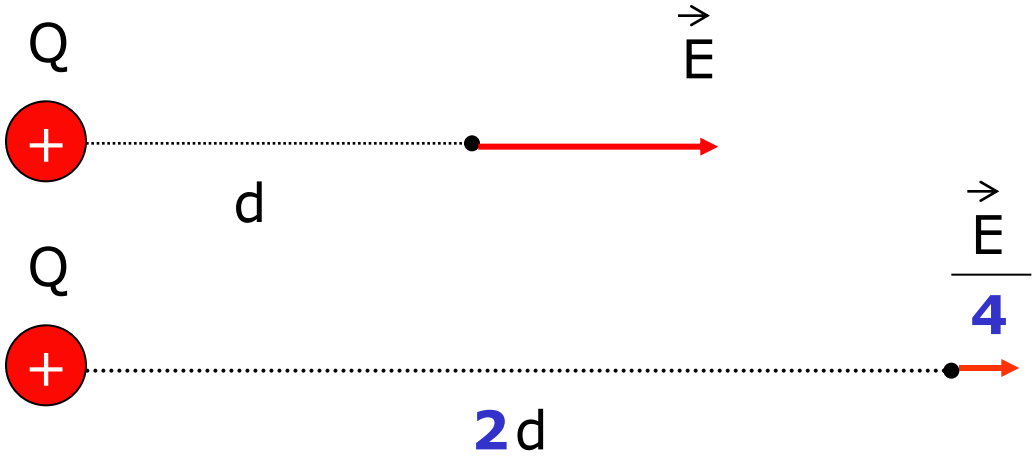
Exemplos

Variando a carga geradora

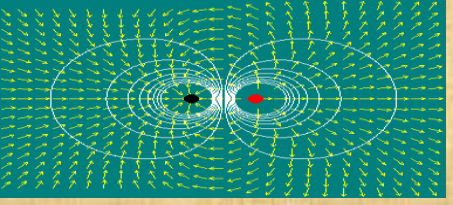


$$2E \;\alpha\; 2Q$$

Variando distância



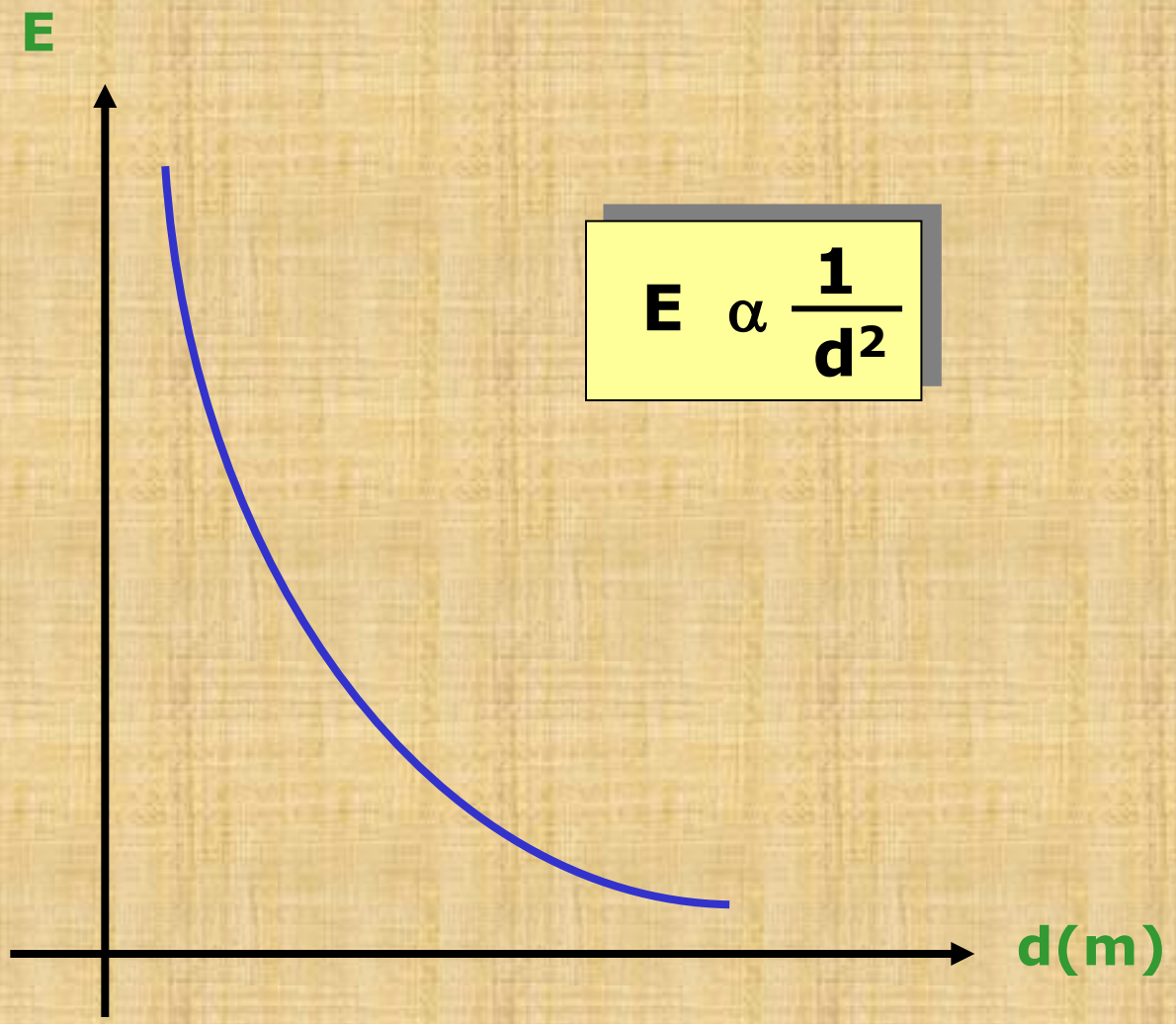
$$\frac{E}{4} \;\alpha\; \frac{1}{(2d)^2}$$



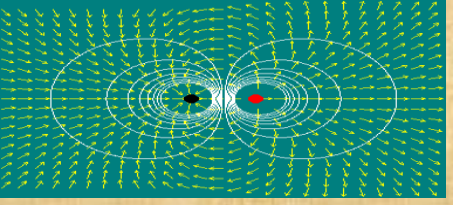
Para uma carga puntiforme

Gráfico E x d

E	d
E	1d
$\frac{E}{4}$	2d
$\frac{E}{9}$	3d
$\frac{E}{16}$	4d

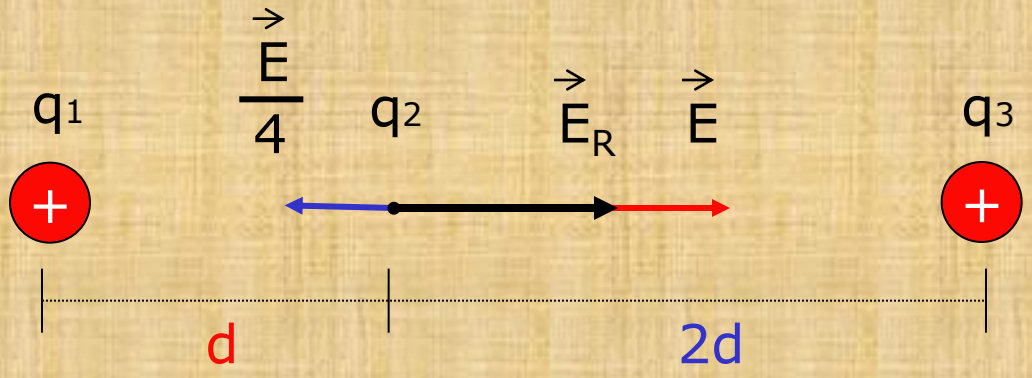


$$E \propto \frac{1}{d^2}$$



Natureza vetorial do Campo Elétrico

1)

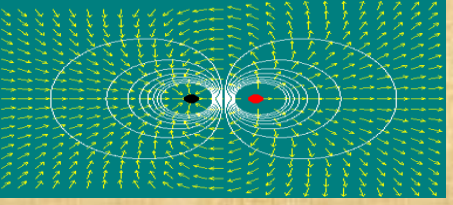


Vetorialmente: $\vec{E}_R = \vec{E}_1 + \vec{E}_2$

$\alpha = 180^o$

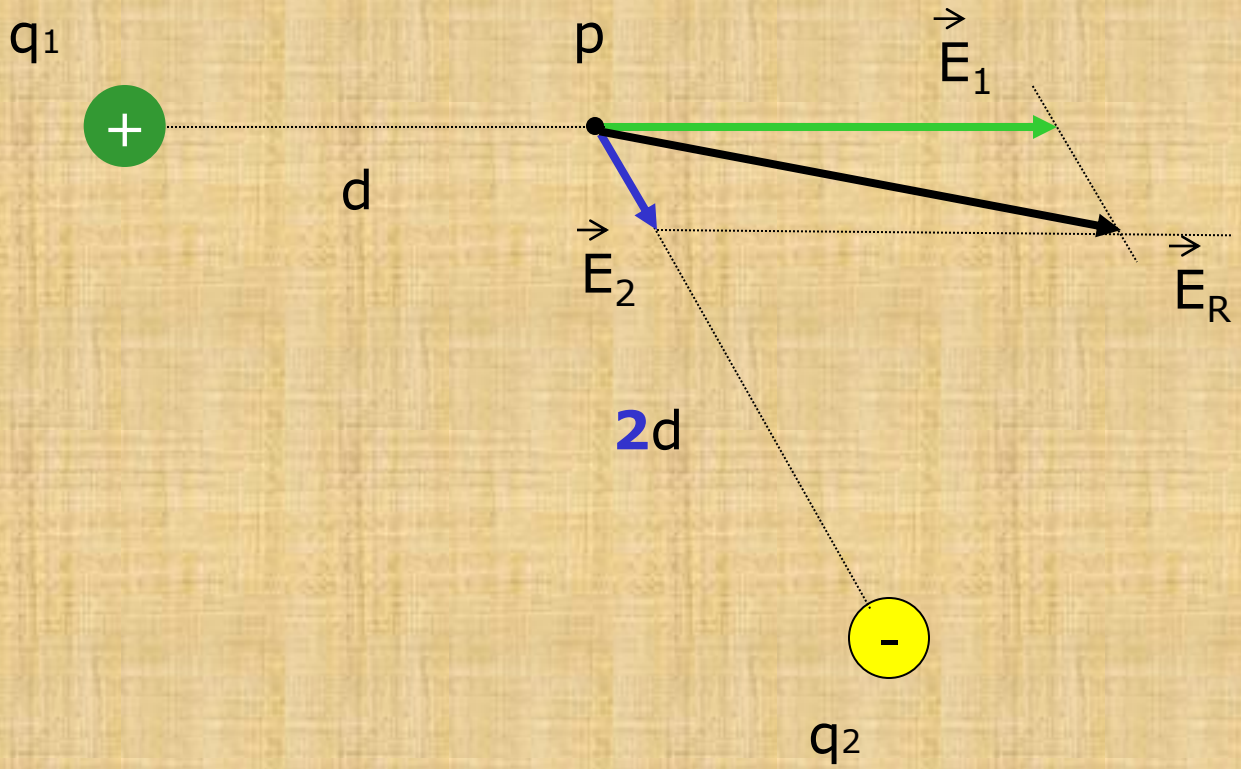
Módulo da resultante: $E_R = \sqrt{E_1^2 + E_2^2 + 2E_1.E_2.\cos\alpha}$

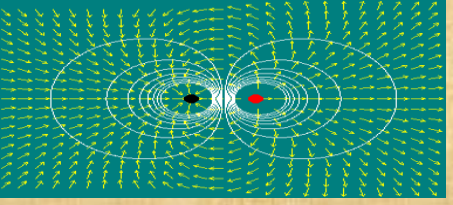
$E_R = E - \frac{E}{4}$ ⇒ $E_R = \frac{3E}{4}$



2)

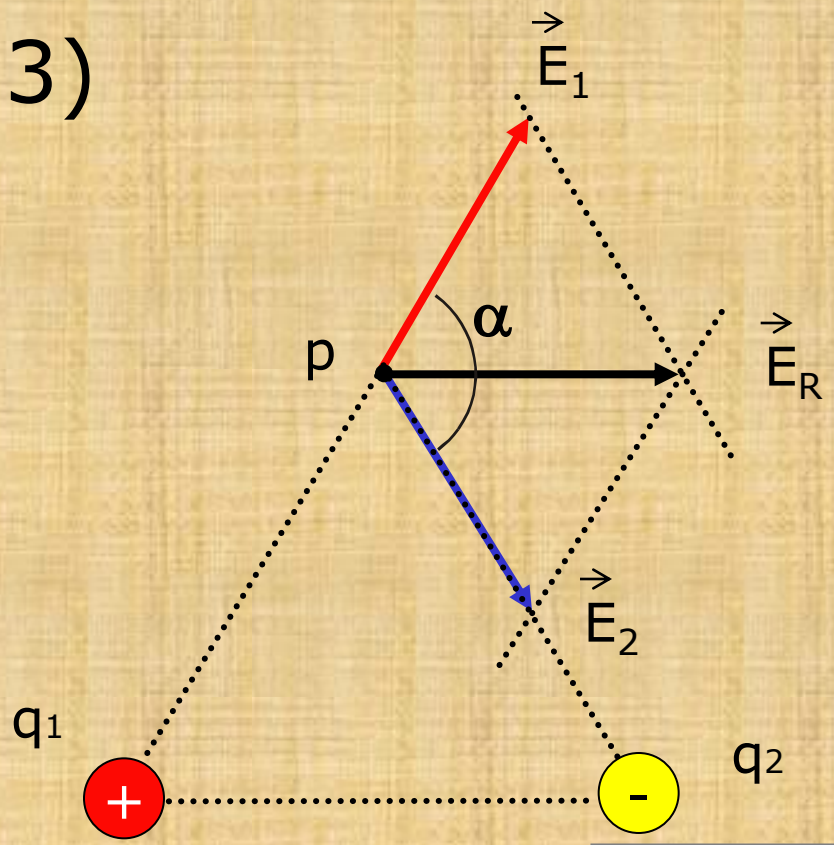
Natureza vetorial do Campo Elétrico





Natureza vetorial do Campo Elétrico

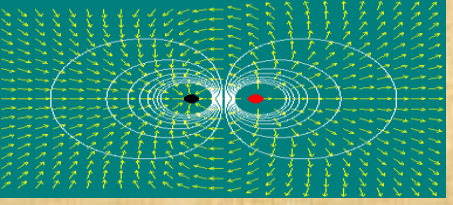
3)



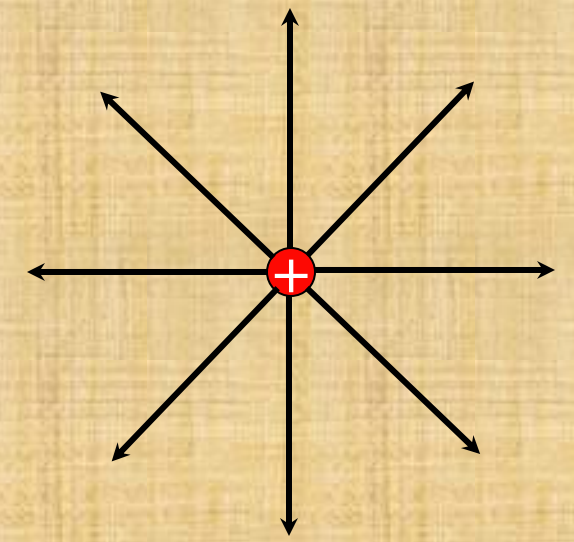
$\alpha = 120^o$

$$\vec{E}_R = \vec{E}_1 + \vec{E}_2$$

$$E_R = \sqrt{E_1^2 + E_2^2 + 2E_1.E_2.\cos\alpha}$$



Linhas de Força

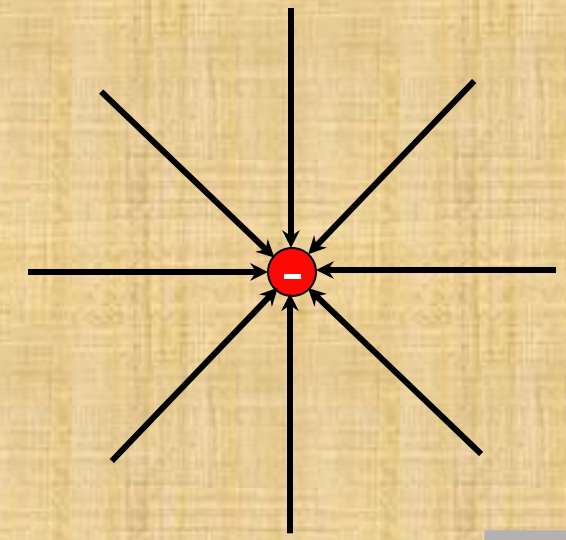


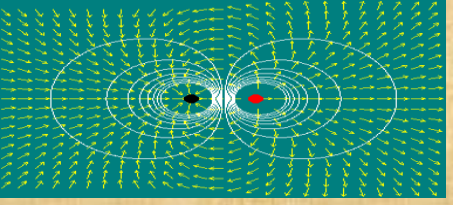
Carga positiva

Campo divergente

Carga negativa

Campo convergente

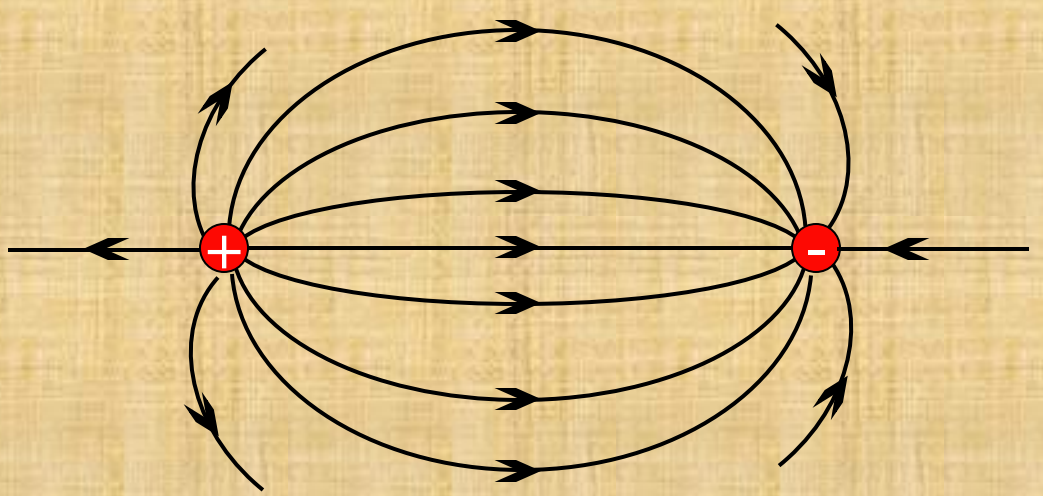


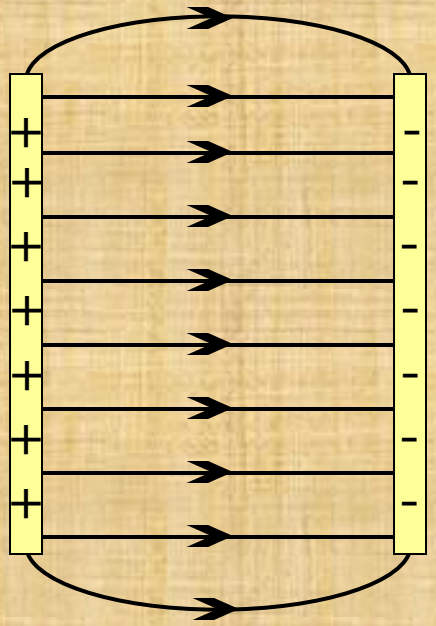


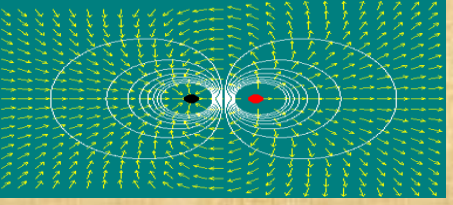
Linhas de Força

Dipolo Elétrico → **Campo Variado**

Placas Paralelas → **Campo Uniforme**



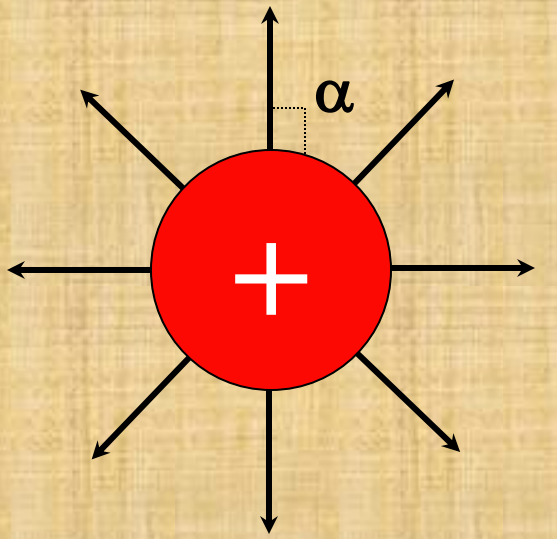


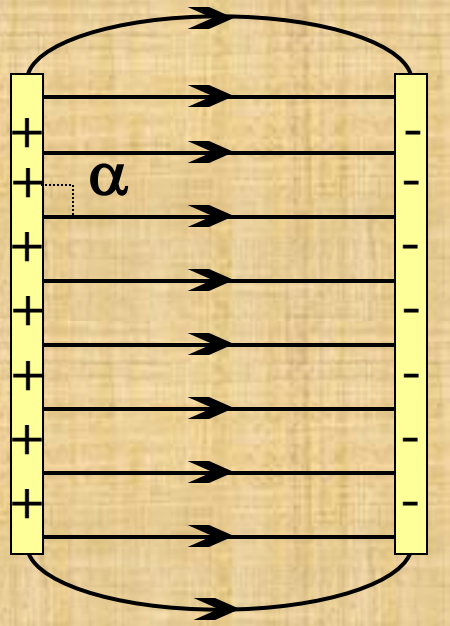


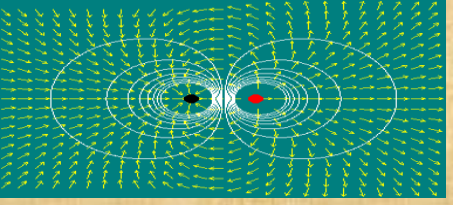
Características das Linhas de Força

1) As Linhas de força são sempre perpendiculares à superfície dos corpos carregados.

$$\alpha = 90^{o}$$

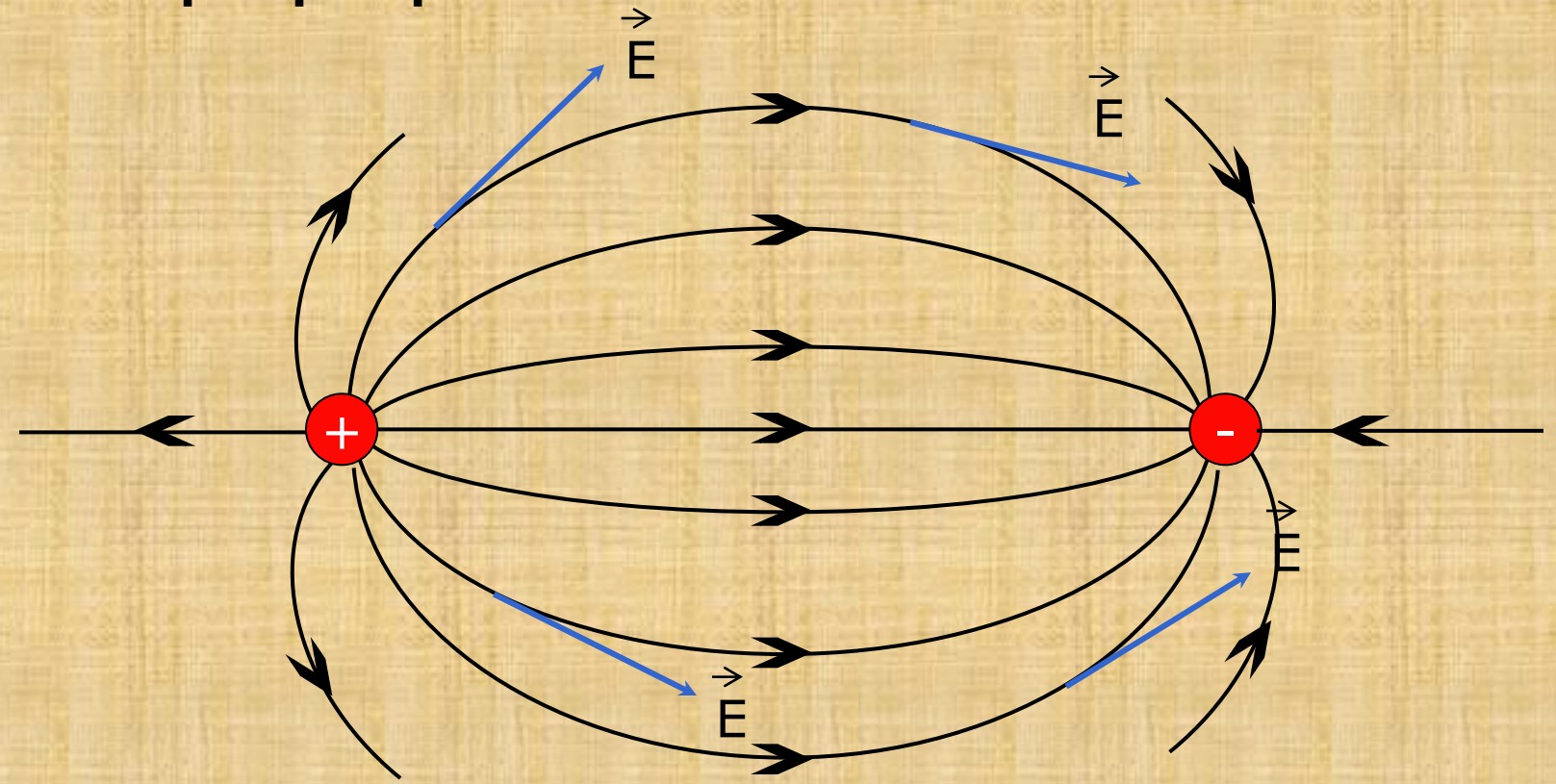


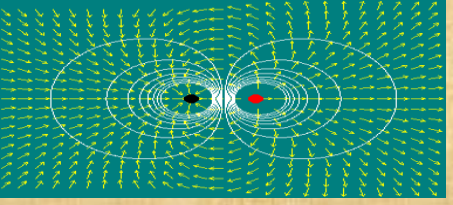




Características das Linhas de Força

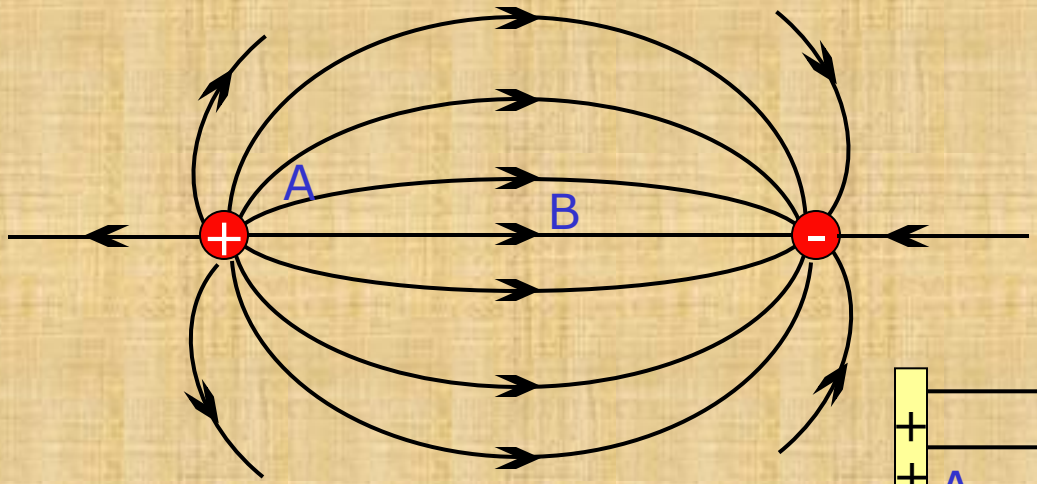
2) O vetor campo elétrico é sempre tangente a uma linha de força em qualquer ponto.





Características das Linhas de Força

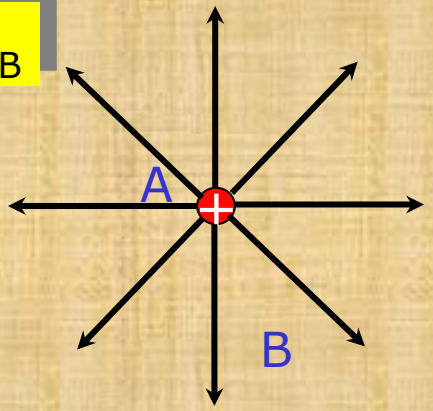
3) A concentração de linhas de força é diretamente proporcional a intensidade do campo elétrico.



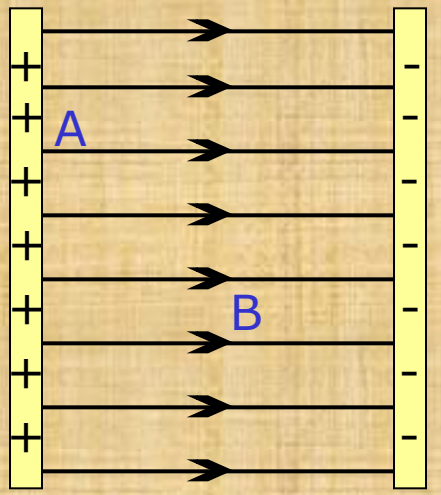
Em A a densidade de linhas é maior do que em B.

$E_A > E_B$

Em A a densidade de linhas é maior do que em B.

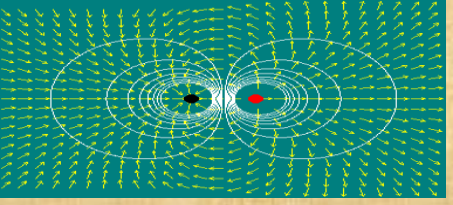


$E_A > E_B$



$E_A = E_B$

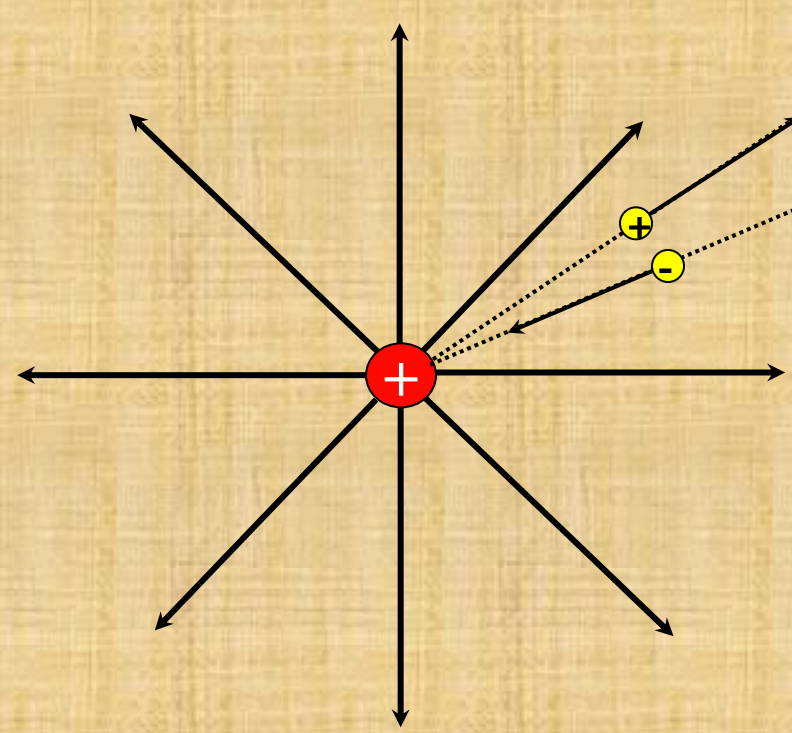
Em A e em B a densidade de linhas é a mesma.

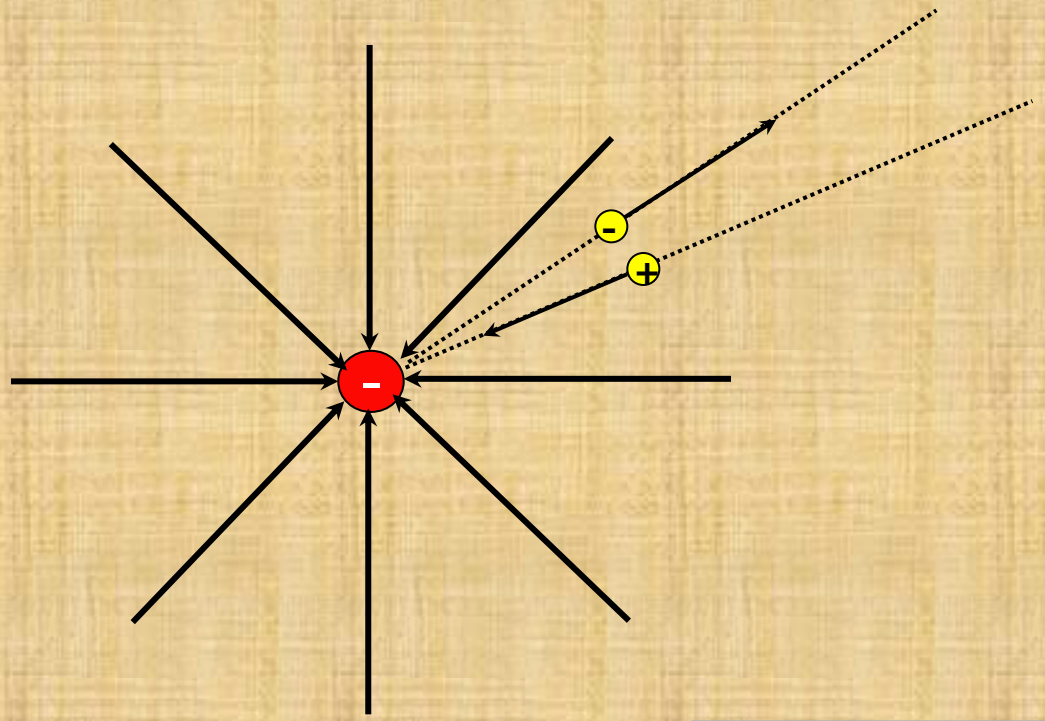


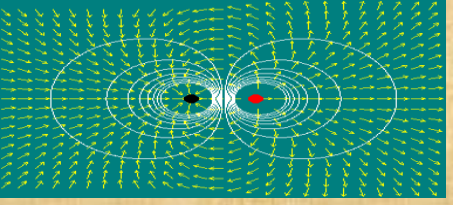
Trajetória de Partículas

Cargas positivas
Movimentam-se a favor do campo

Cargas negativas
Movimentam-se contra o campo

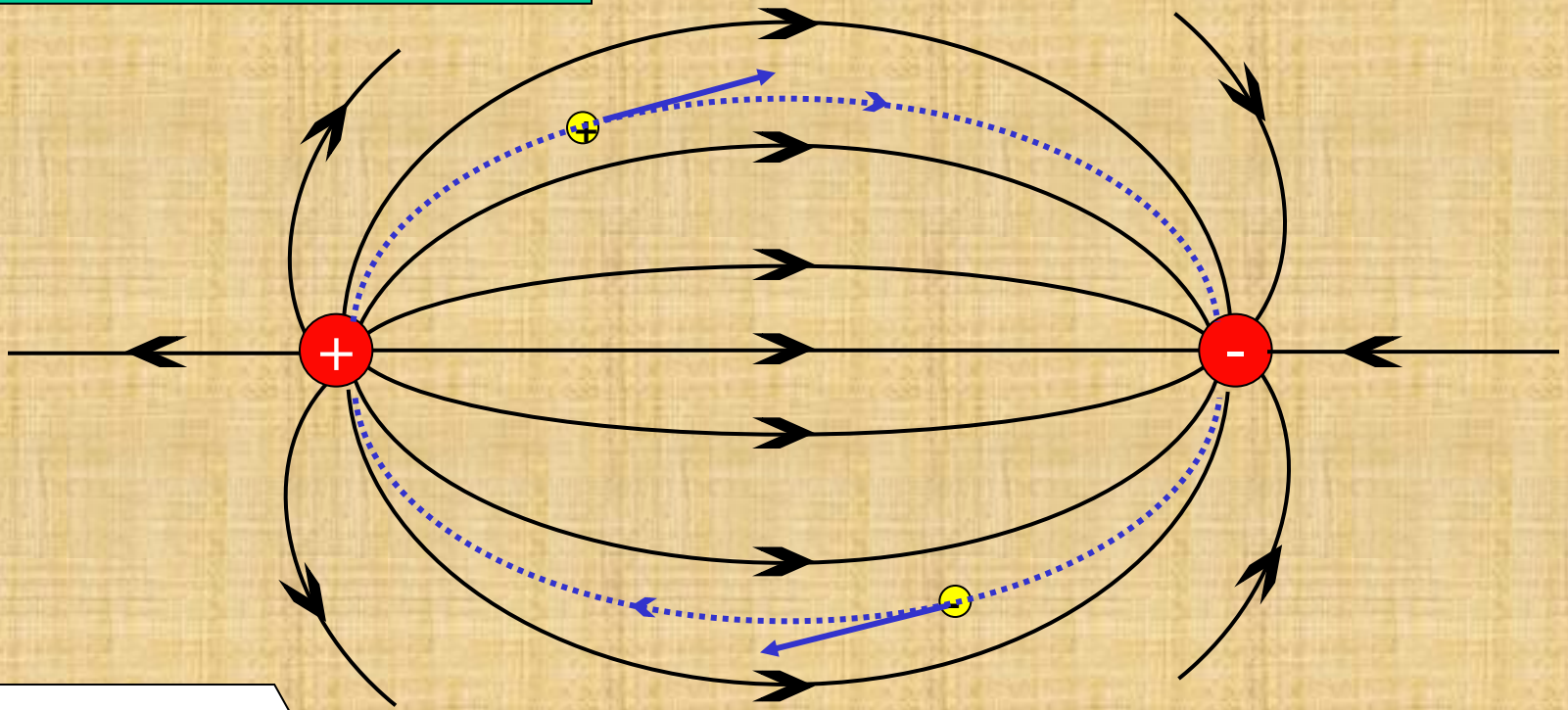




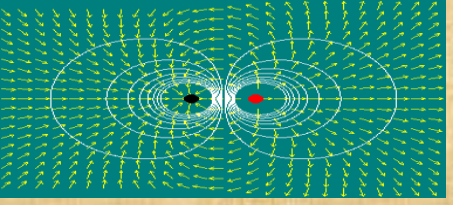


Trajetória de Partículas

Cargas **positivas** movimentam-se espontaneamente a favor do campo

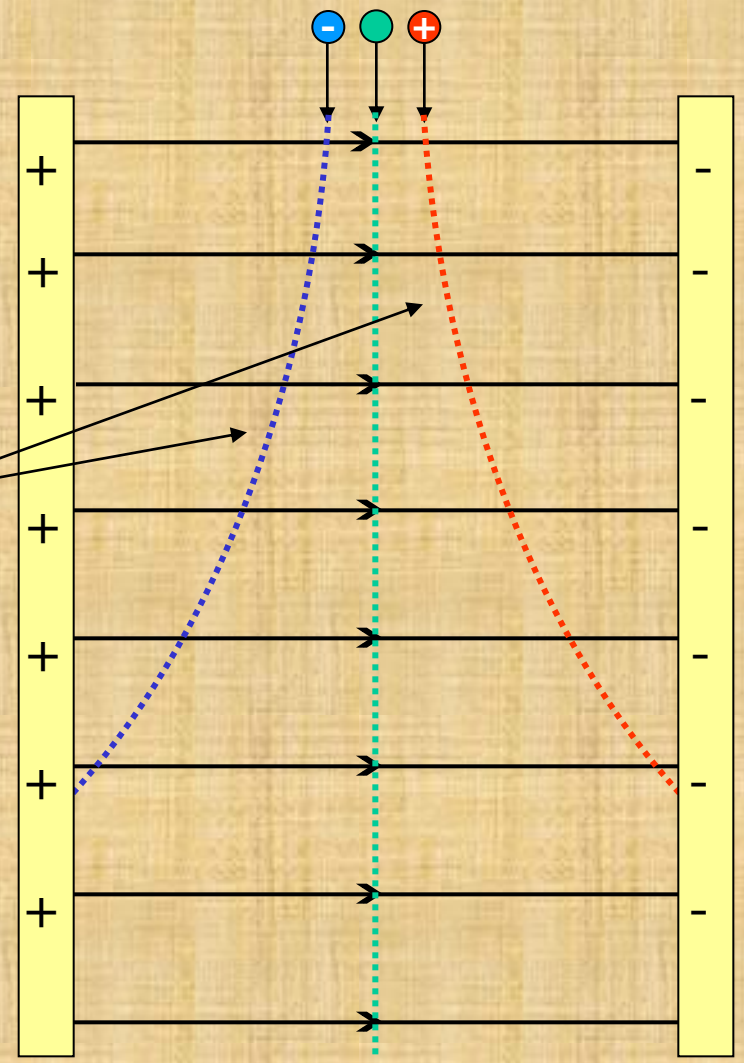


Cargas **negativas** movimentam-se espontaneamente contra o campo



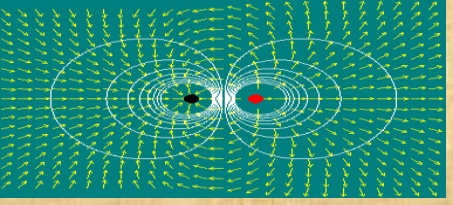
Trajetória de Partículas

Trajetórias Parabólicas

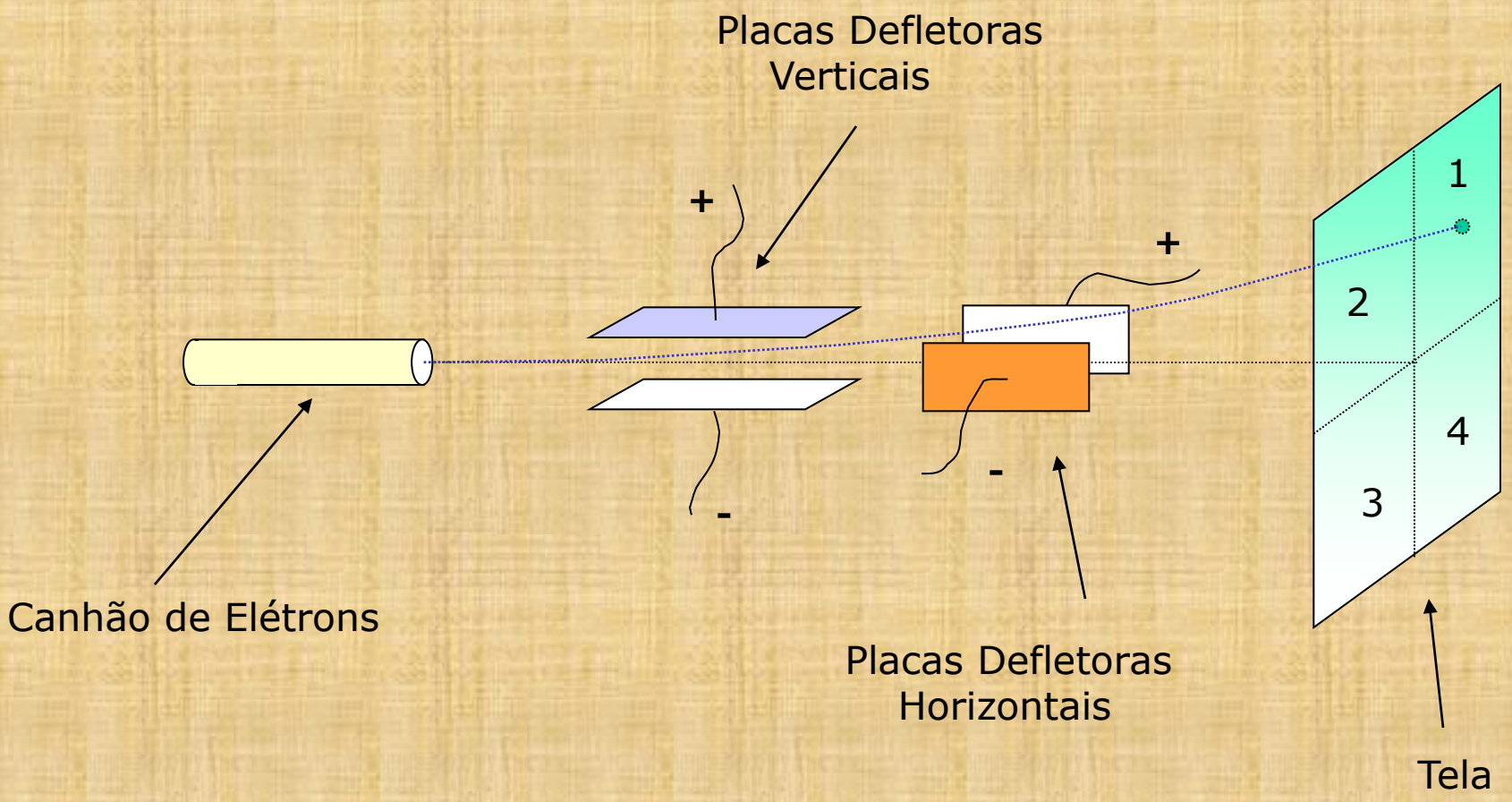


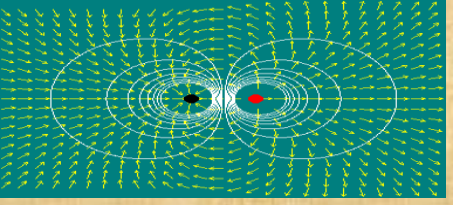
Cargas **positivas** movimentam-se espontaneamente a favor do campo

Cargas **negativas** movimentam-se espontaneamente contra o campo

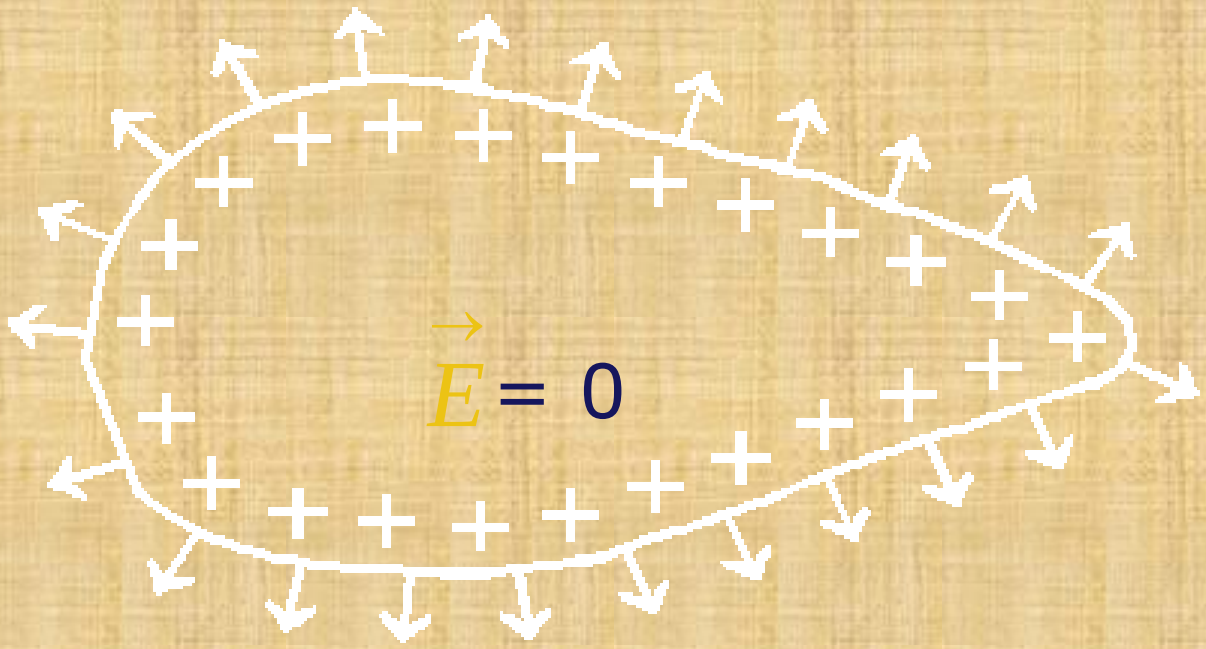


O Osciloscópio

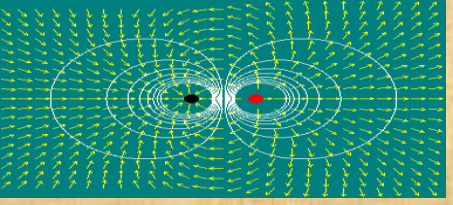




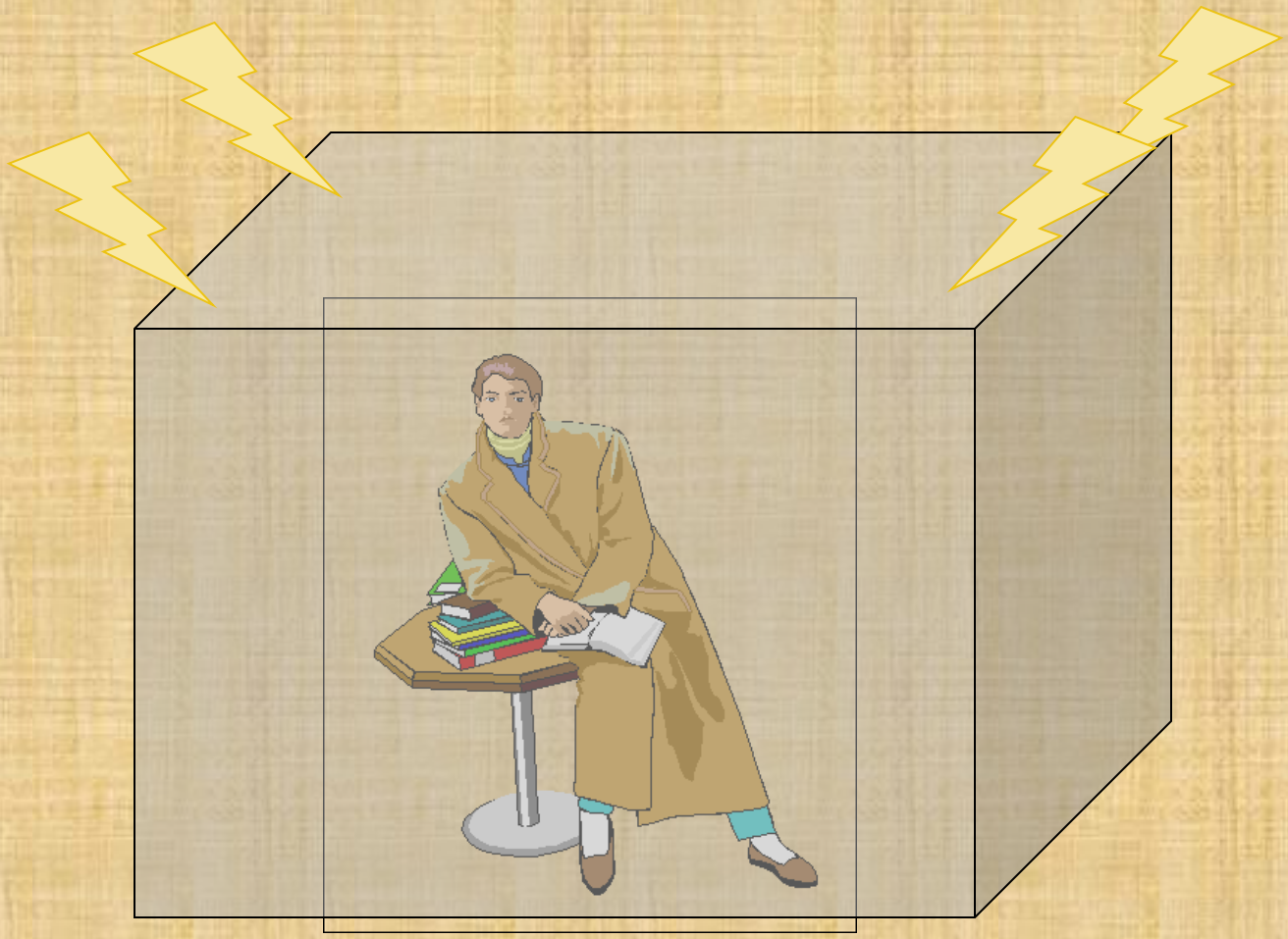
Campo Elétrico de Condutores Eletrizados



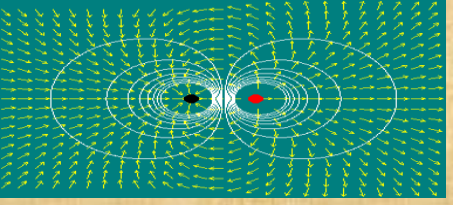
O Campo Elétrico no interior de um condutor é **nulo**.



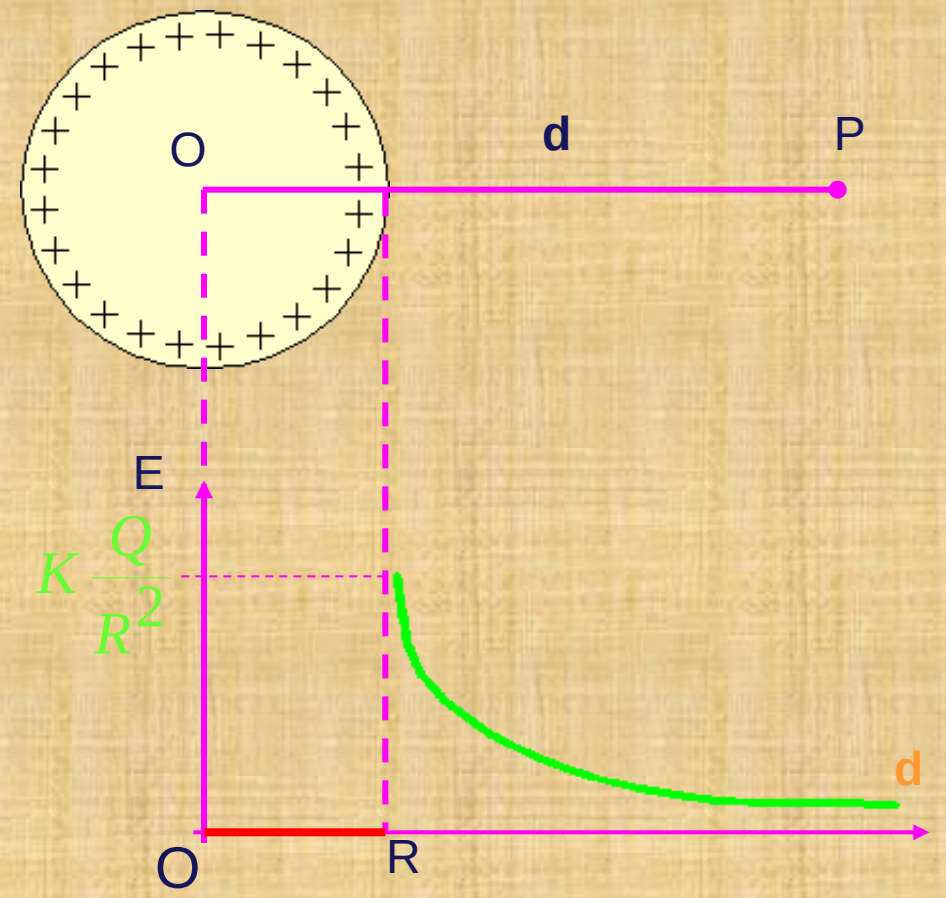
Blindagem Eletrostática



Ana Barros



Esfera Condutora



d - distância do centro da esfera ao ponto considerado na parte externa.

Q - carga da esfera, que se comporta como uma carga puntiforme no centro da mesma.

Campo Elétrico de um condutor esférico carregado

AULAS eletricidade: 13,20 e 27

aula monitor

dias 14, 21 3 28 começar aula as 13hs

Prova dia 11- terça as 2 turmas juntas.

Hoje dia 6, campo e lei de Gauss
Amanha dia 07- potencial elétrico

Dia 13, resolução /dúvidas das listas com o monitor
Dia 14- acabar potencial e começar capacitores

Dia 20, resolução /dúvidas das listas com o monitor
Dia 21- começar capacitores e começar corrente elétrica

Dia 28, resolução /dúvidas das listas com o monitor
Dia 29- acabar corrente e começar circuitos

Dia 4 - revisão completa

Dia 5- revisão completa

Dia 11- 1ª PROVA

Dia 18 e 19 - entrega das provas + matéria nova: campo magnético

Bem.. Continuação da matéria..

Lei de Gauss – aplicação de campo elétrico