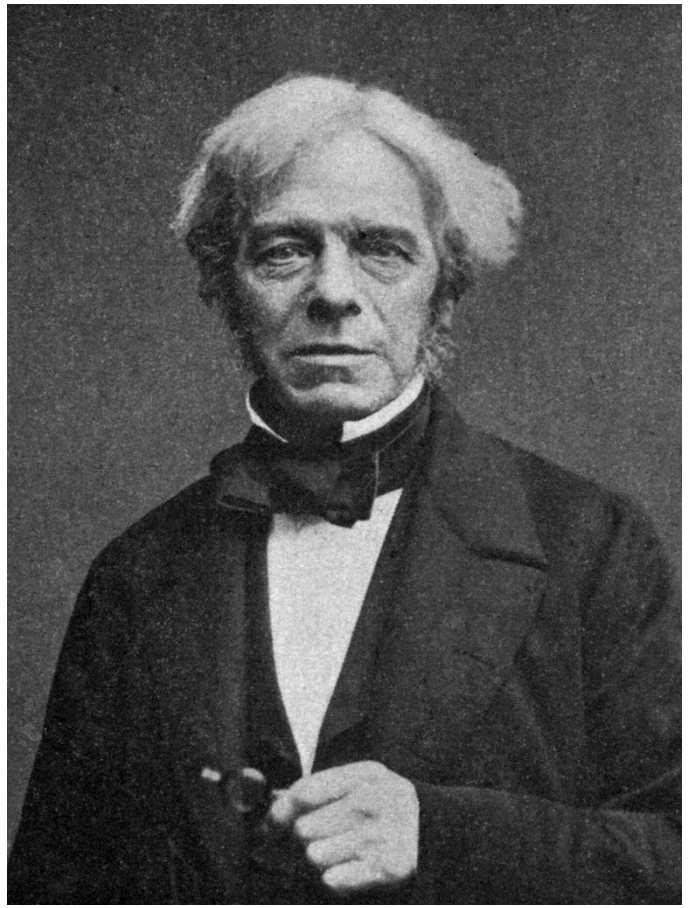
Campo Elétrico de uma carga elétrica puntiforme

Prof. Double
Física

Vetor Campo Elétrico

Michael Faraday:



- Na primeira metade do século XIX, o físico propôs o conceito de campo para explicar as interações elétricas ocorridas a distância.

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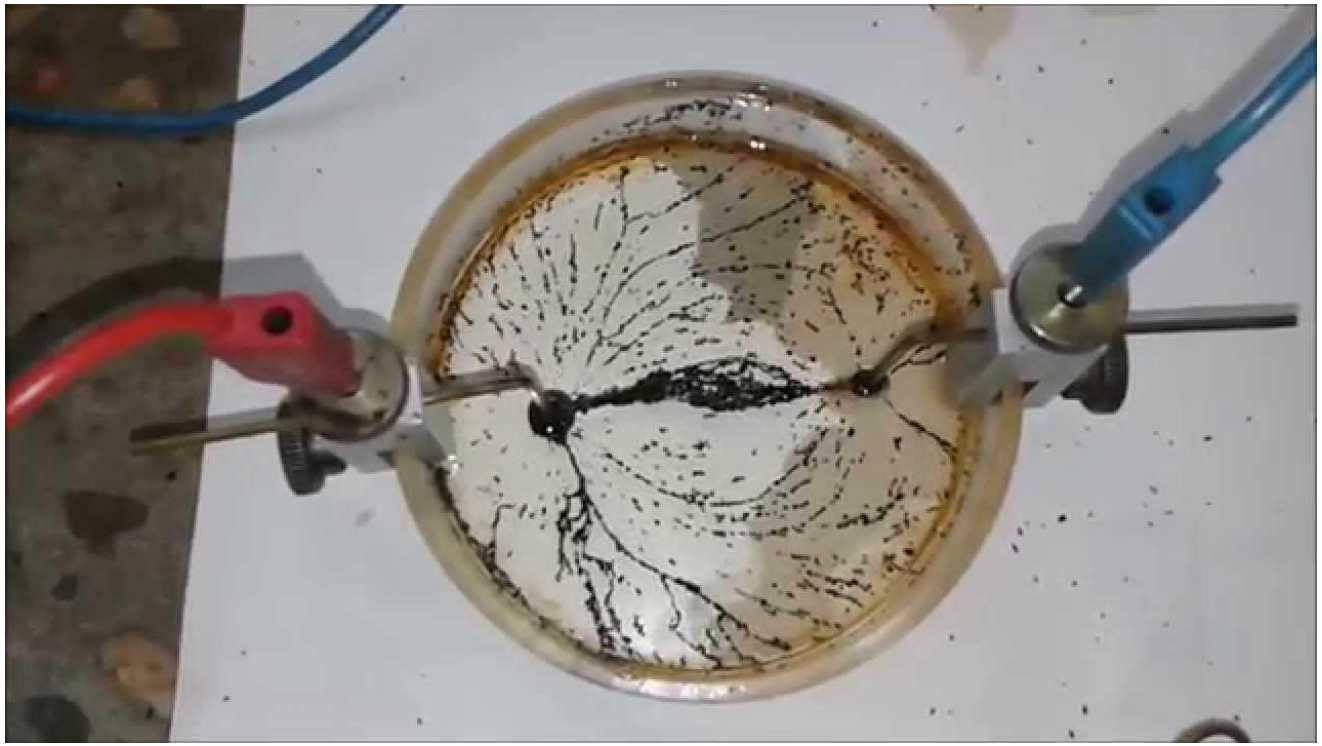

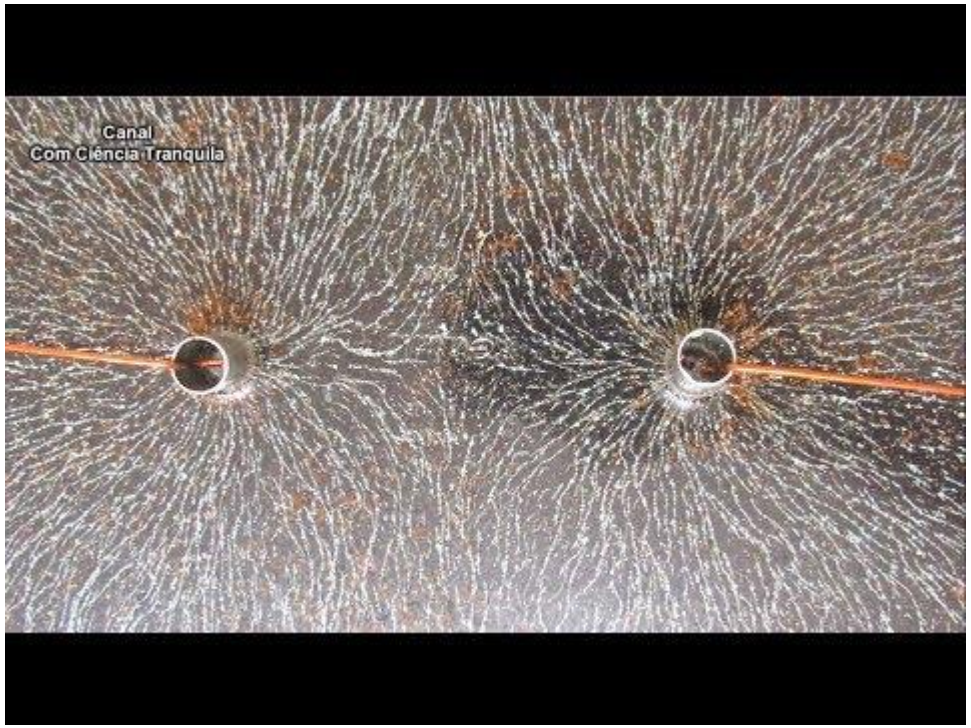

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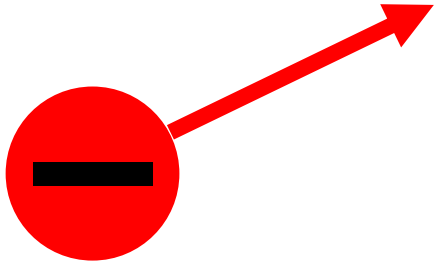
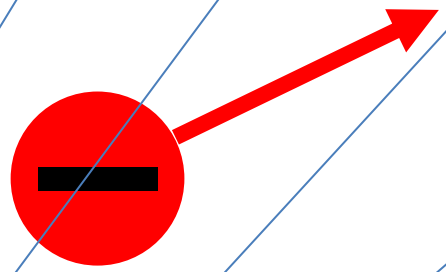
“Só há força se há campo”



Vetor Campo Elétrico

"Só há força se há campo"



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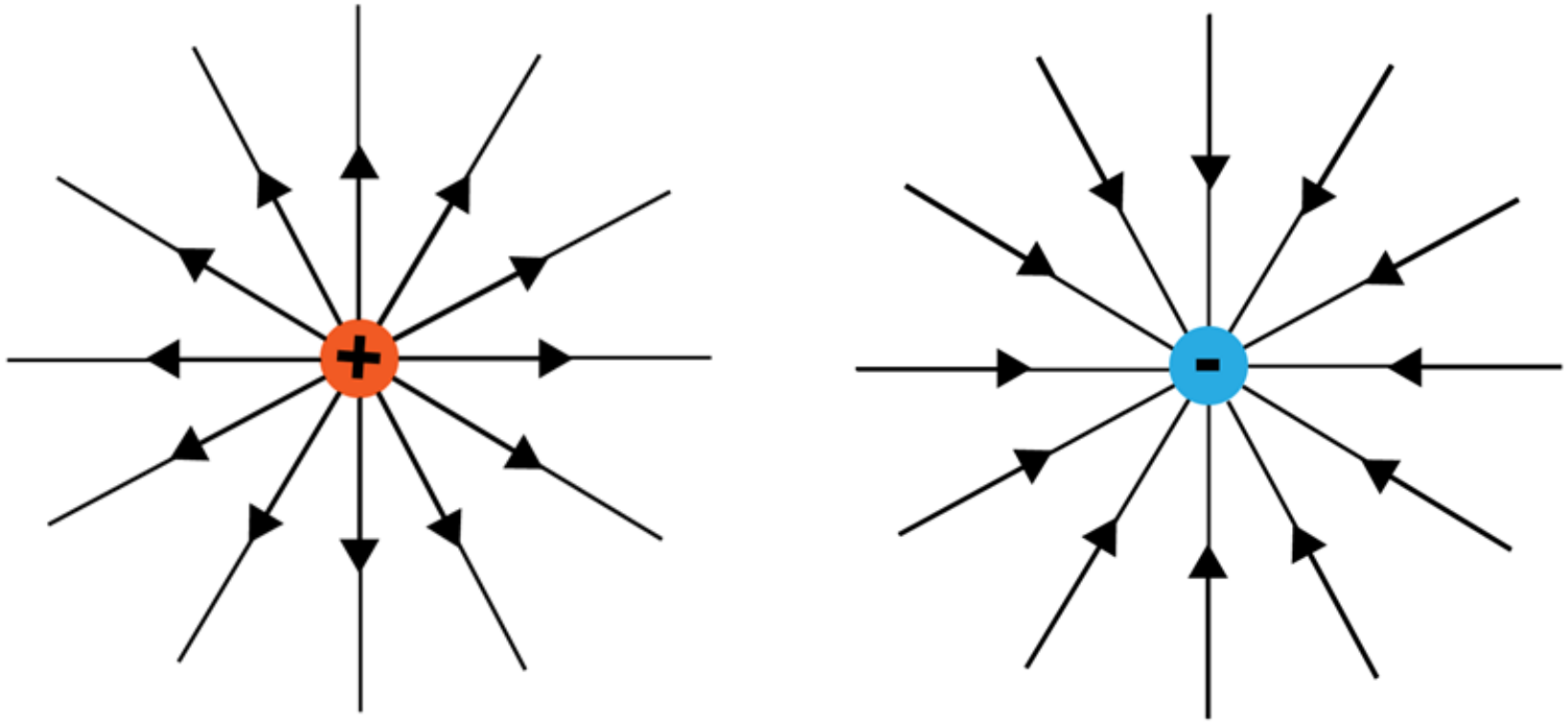
Toda carga produz campo!



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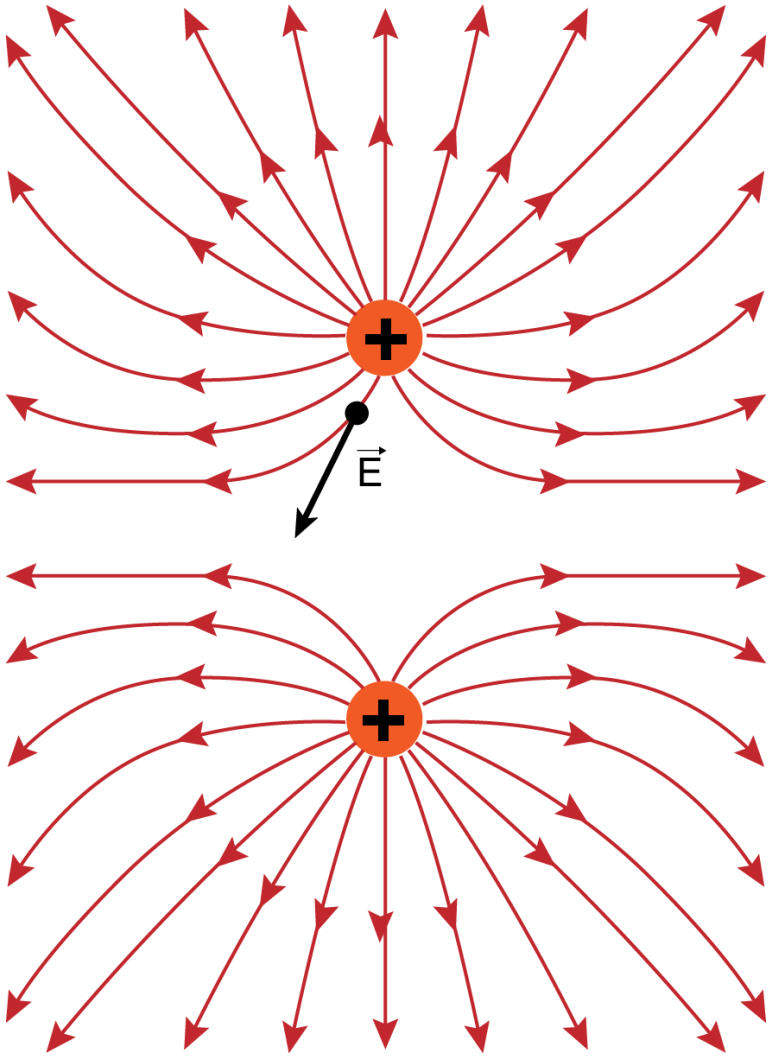

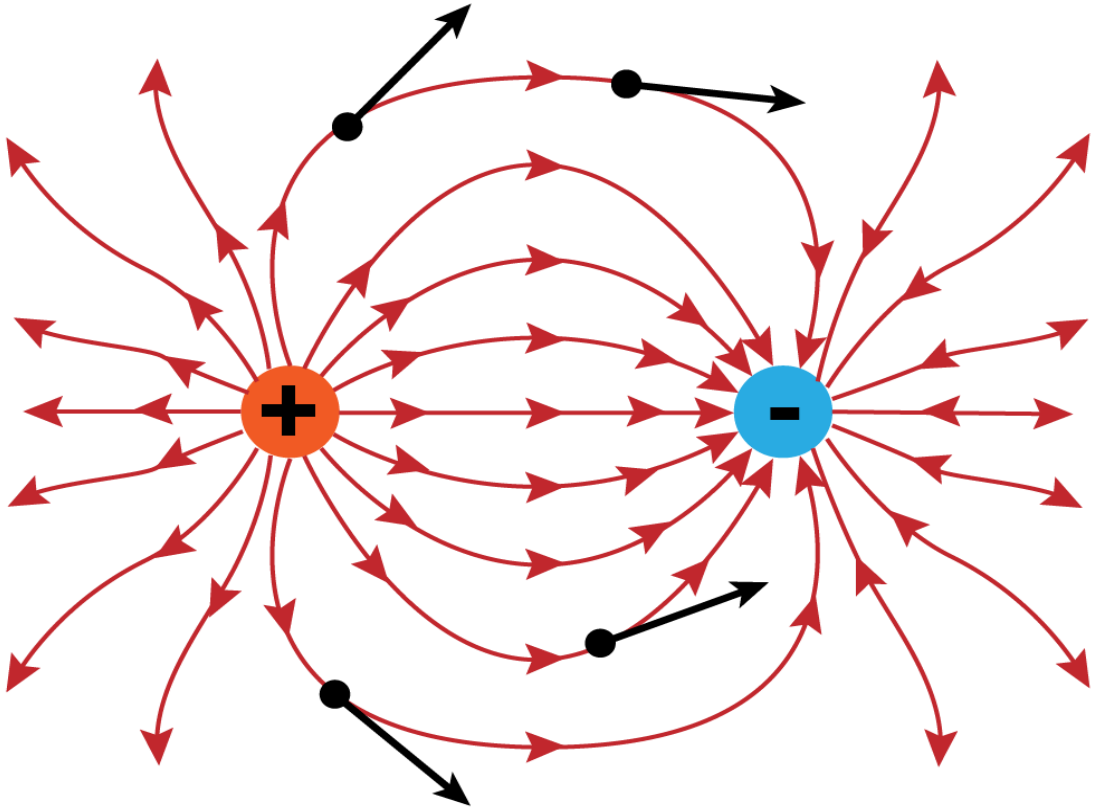

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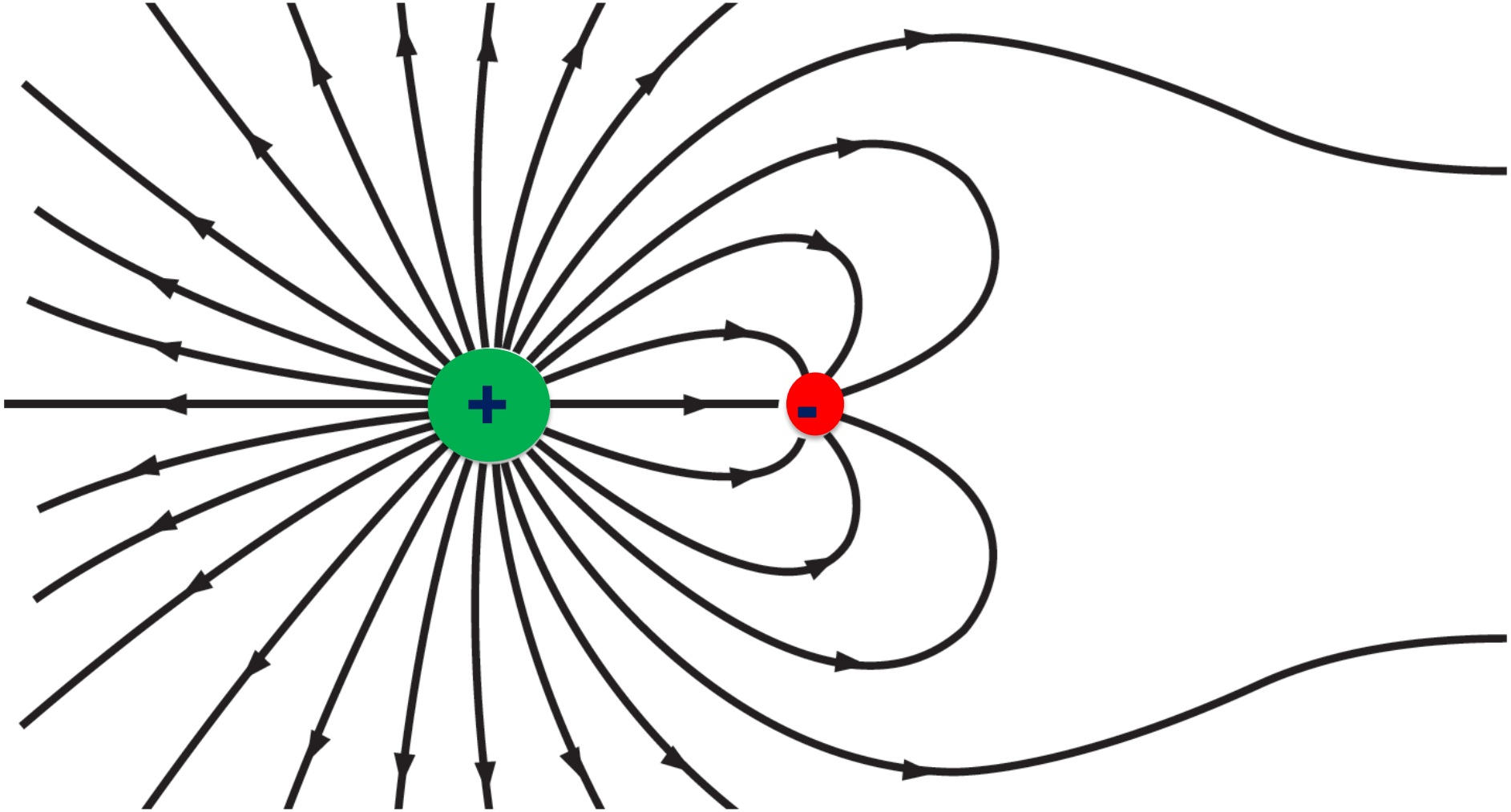

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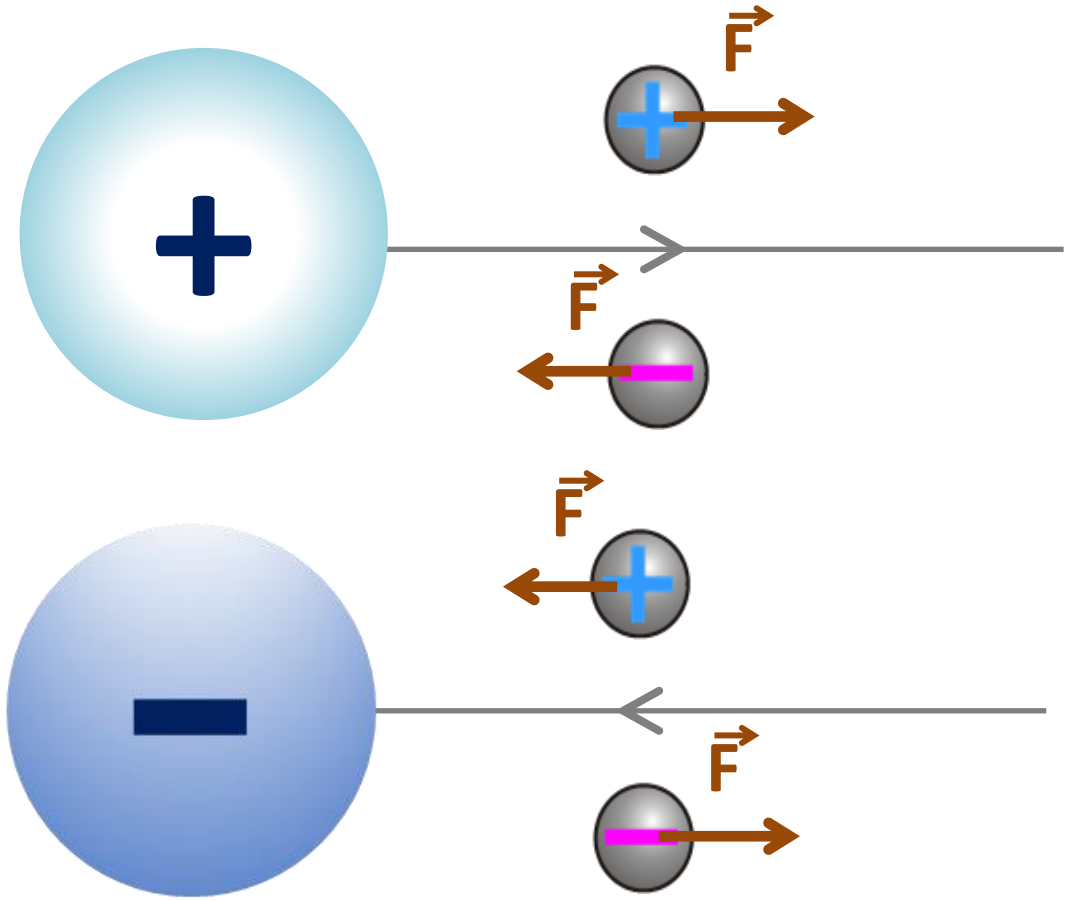
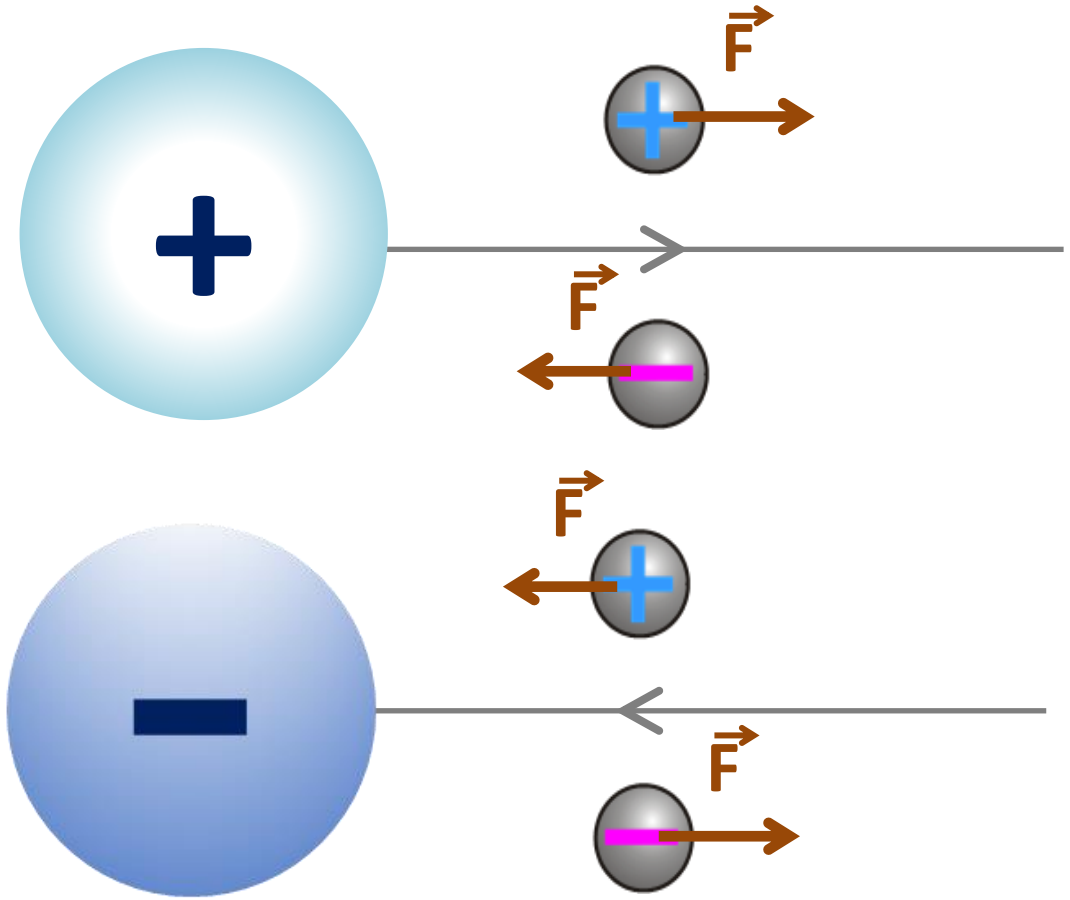


Importante

1) **FORÇA ELÉTRICA** e **CAMPO ELÉTRICO** têm sempre a **mesma direção**.

2) **FORÇA ELÉTRICA** e **CAMPO ELÉTRICO** nem sempre têm o **mesmo sentido**.

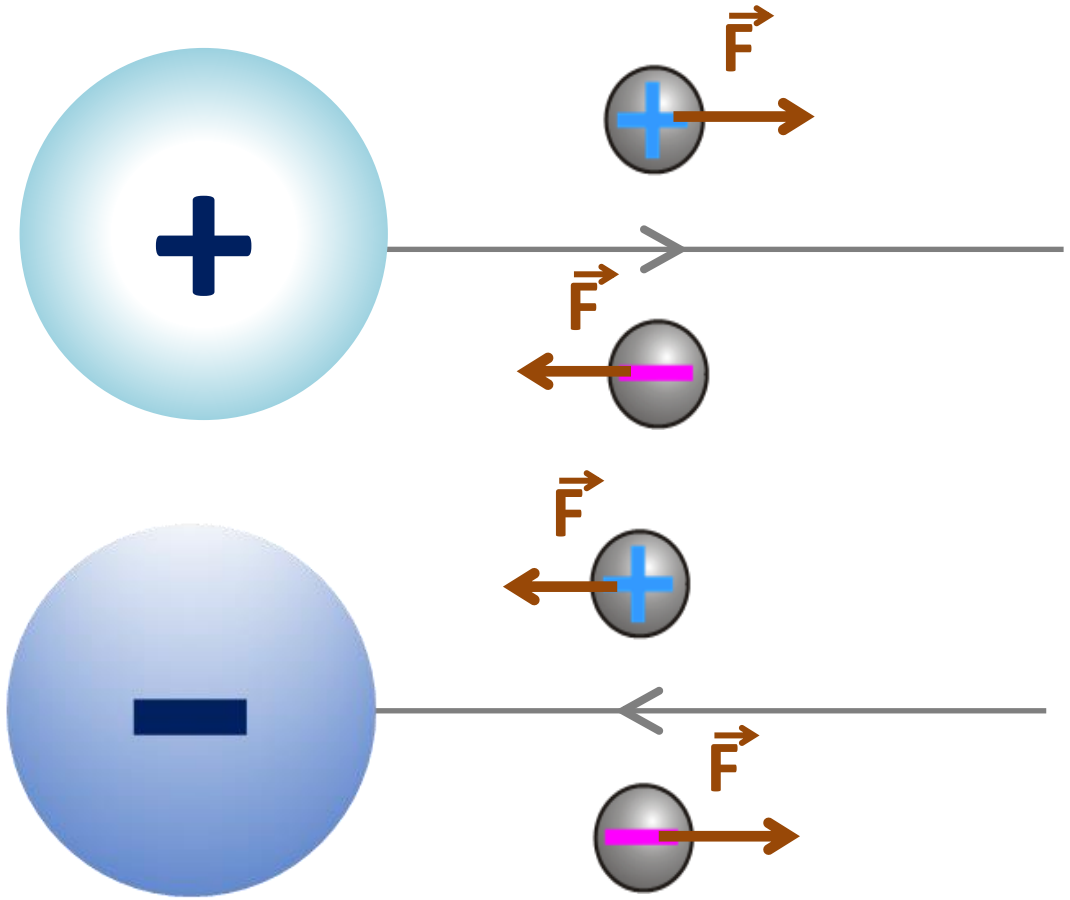
Vetor Campo Elétrico



Importante

1) Uma **carga positiva** sempre se desloca espontaneamente no **mesmo sentido do campo elétrico**.
2) Uma **carga negativa** sempre se desloca espontaneamente no **sentido oposto ao campo elétrico**.

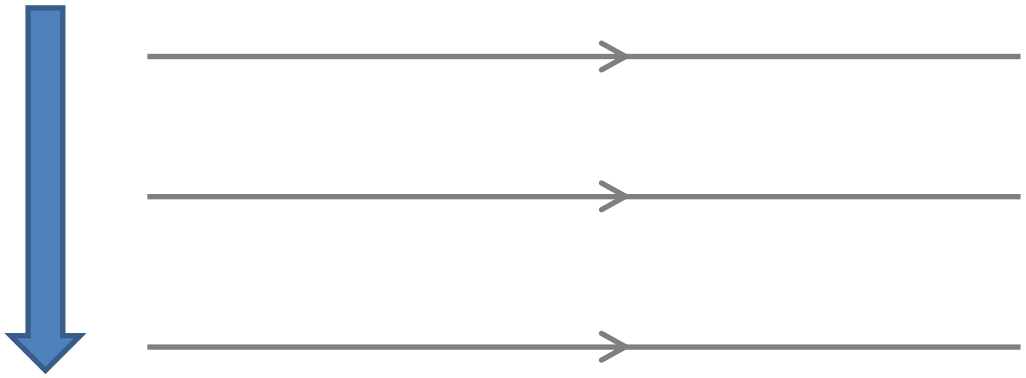
Vetor Campo Elétrico

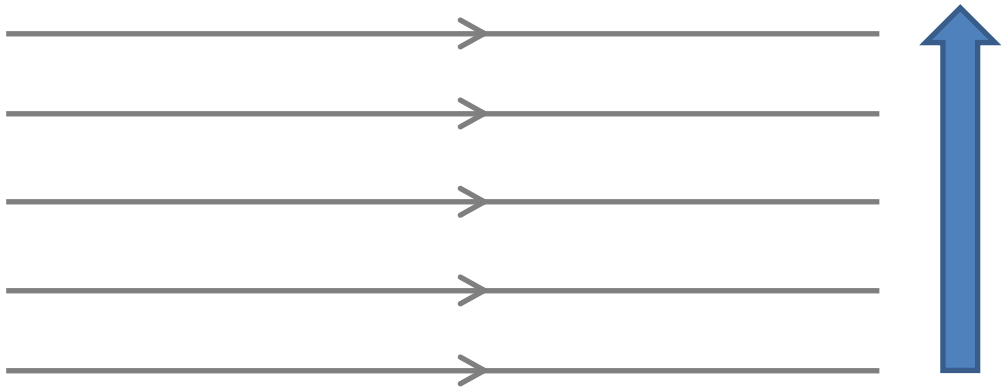


$$\vec{E} = \frac{\vec{F}}{q}$$

Vetor Campo Elétrico

Intensidade:





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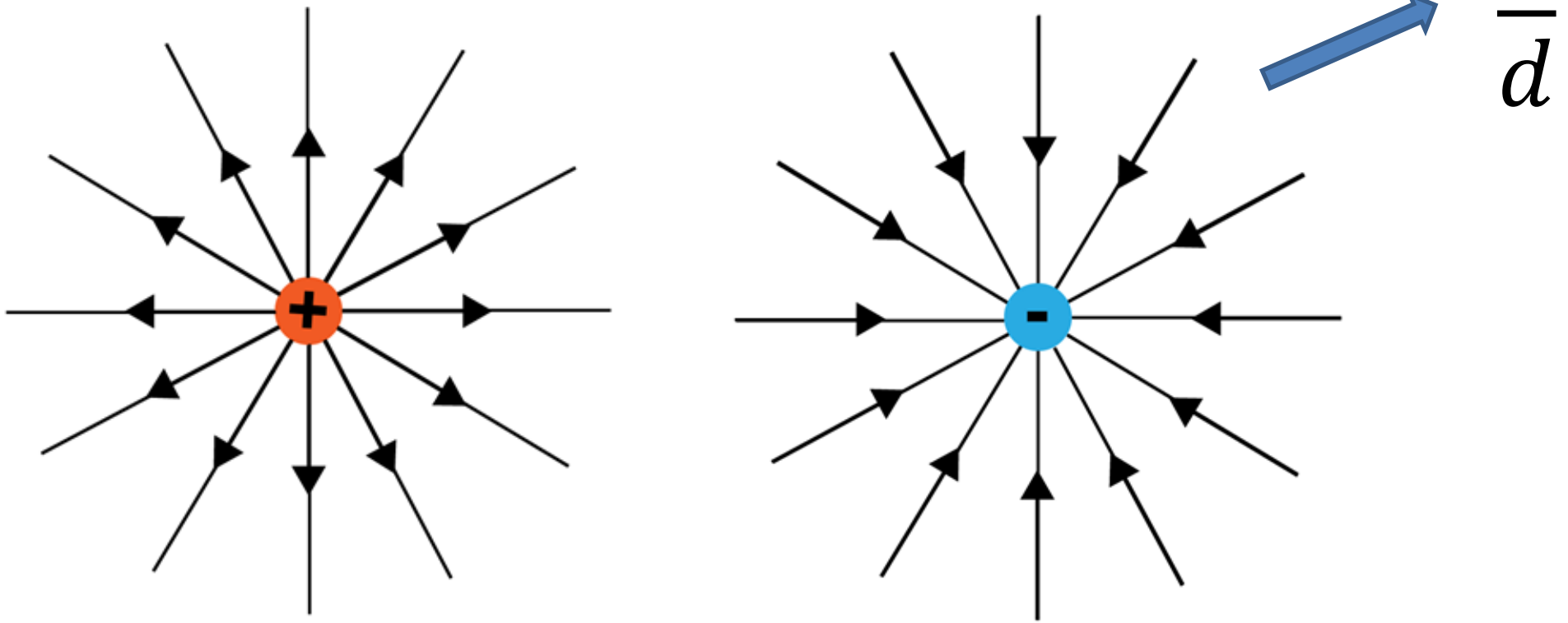
Intensidade:



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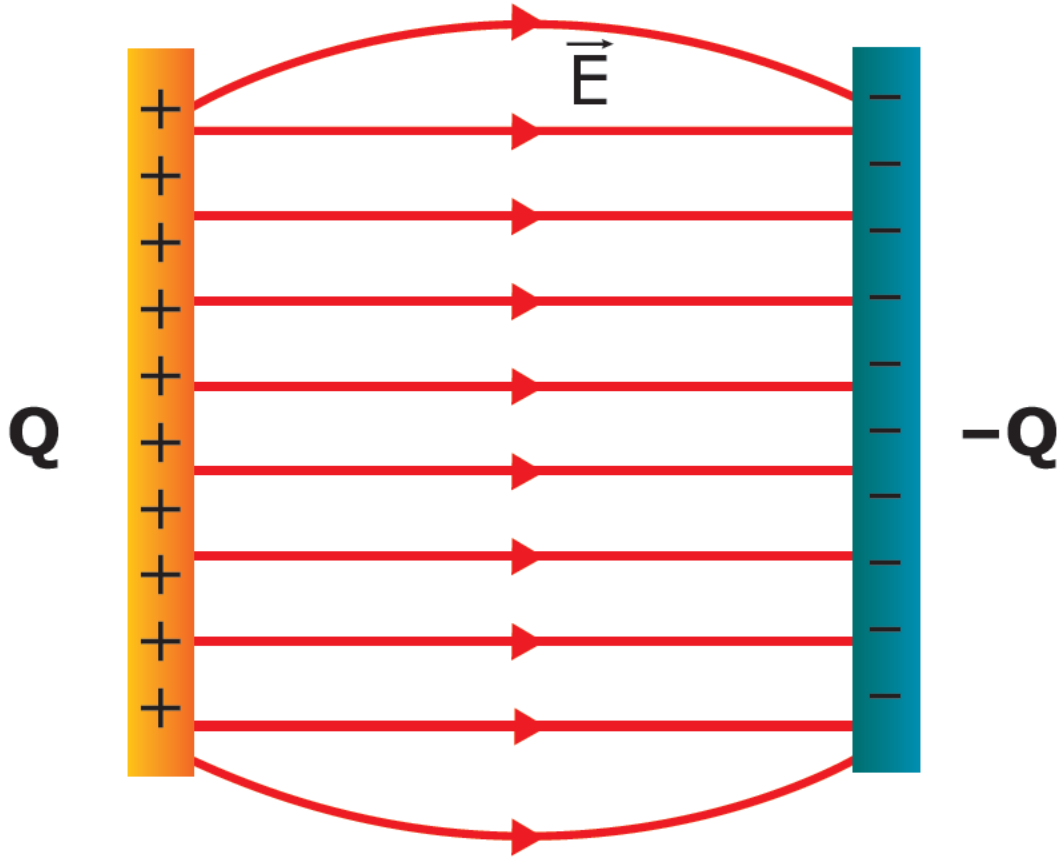
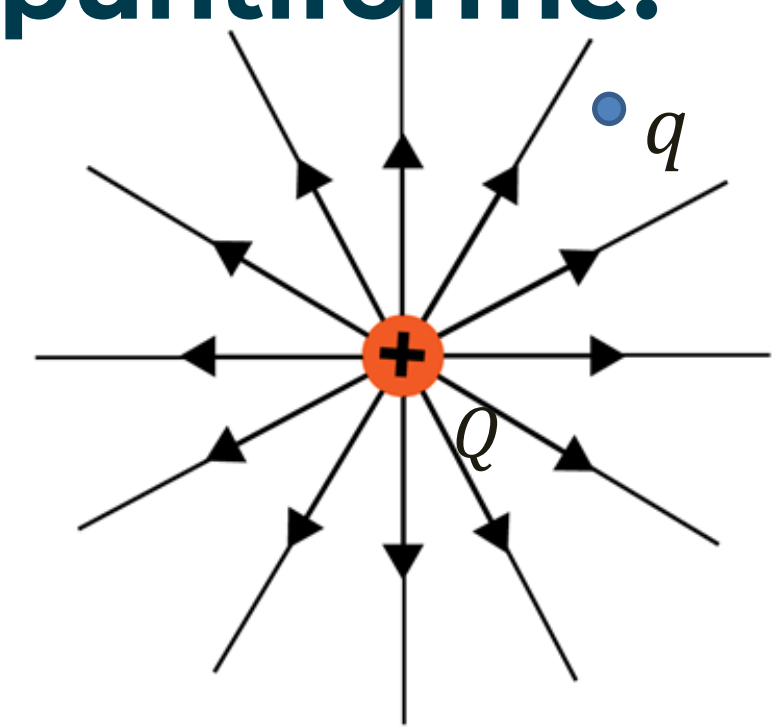
Campo Uniforme:



Vetor Campo Elétrico

Campo de uma carga puntiforme:



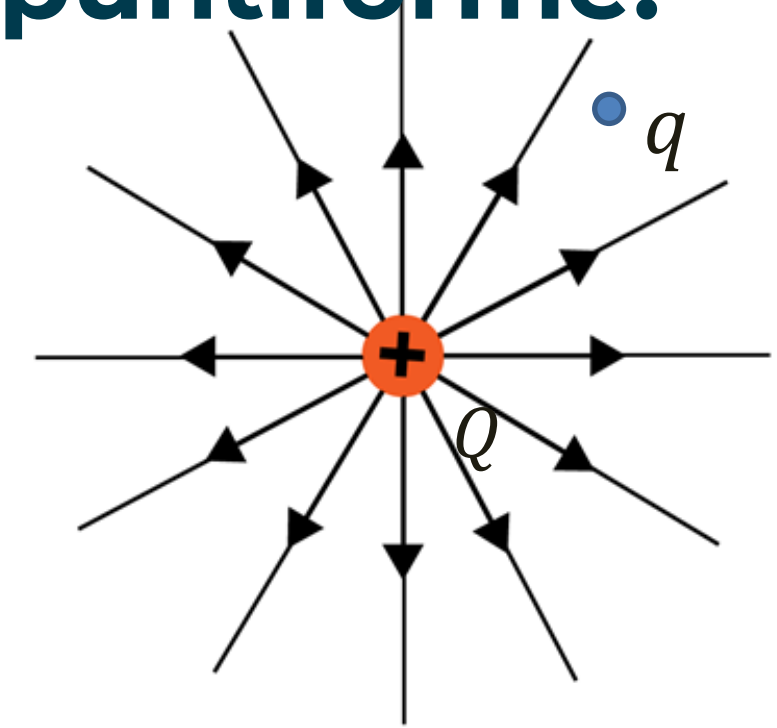
$$\vec{E} = \frac{\vec{F}}{q}$$

Vetor Campo Elétrico

Lei de Coulomb:

$$F = k\frac{Q_1 Q_2}{d^2}$$

Campo de uma carga puntiforme:



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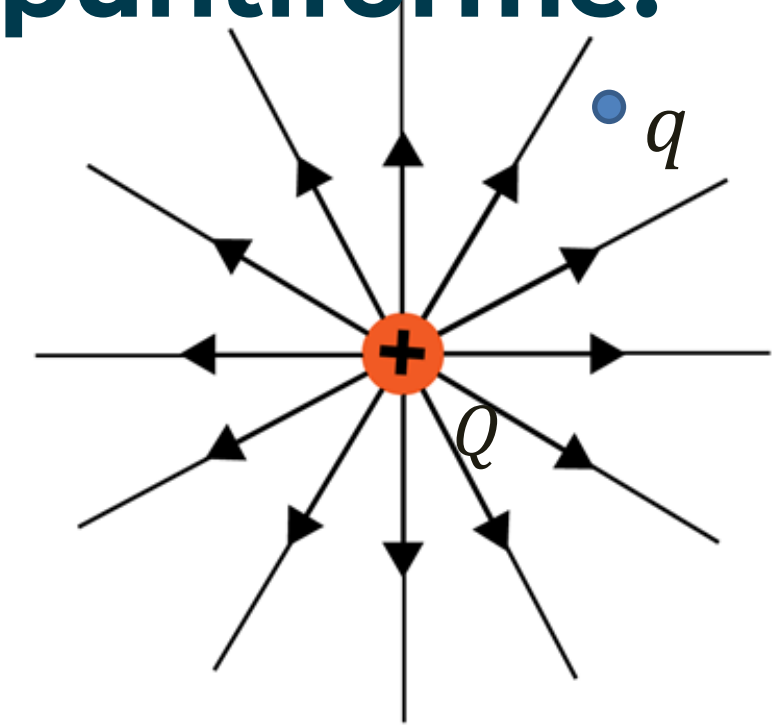

$$E = \frac{F}{q} \Longrightarrow \frac{k\frac{Qq}{d^2}}{q}$$

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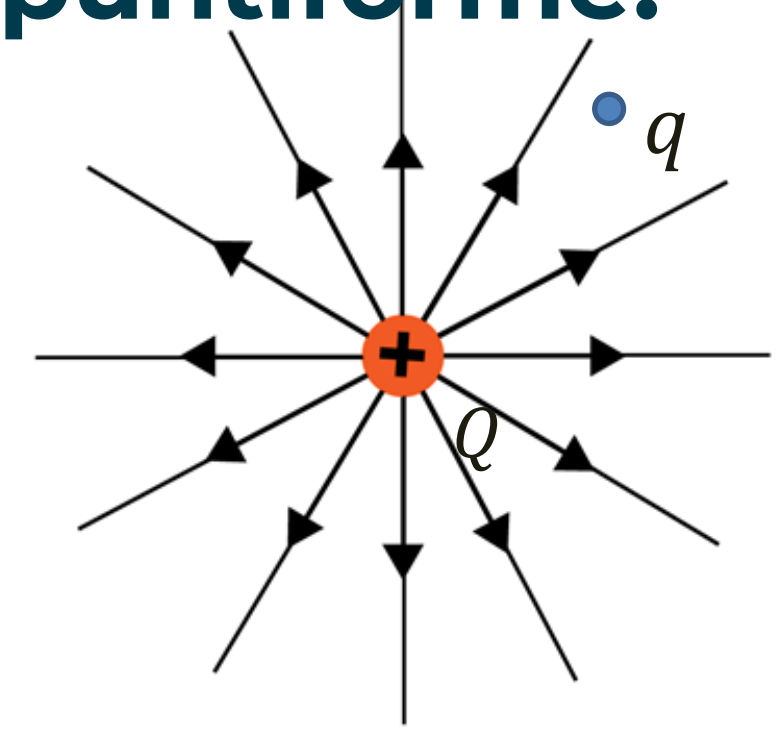
Campo de uma carga puntiforme:



Lei de Coulomb:

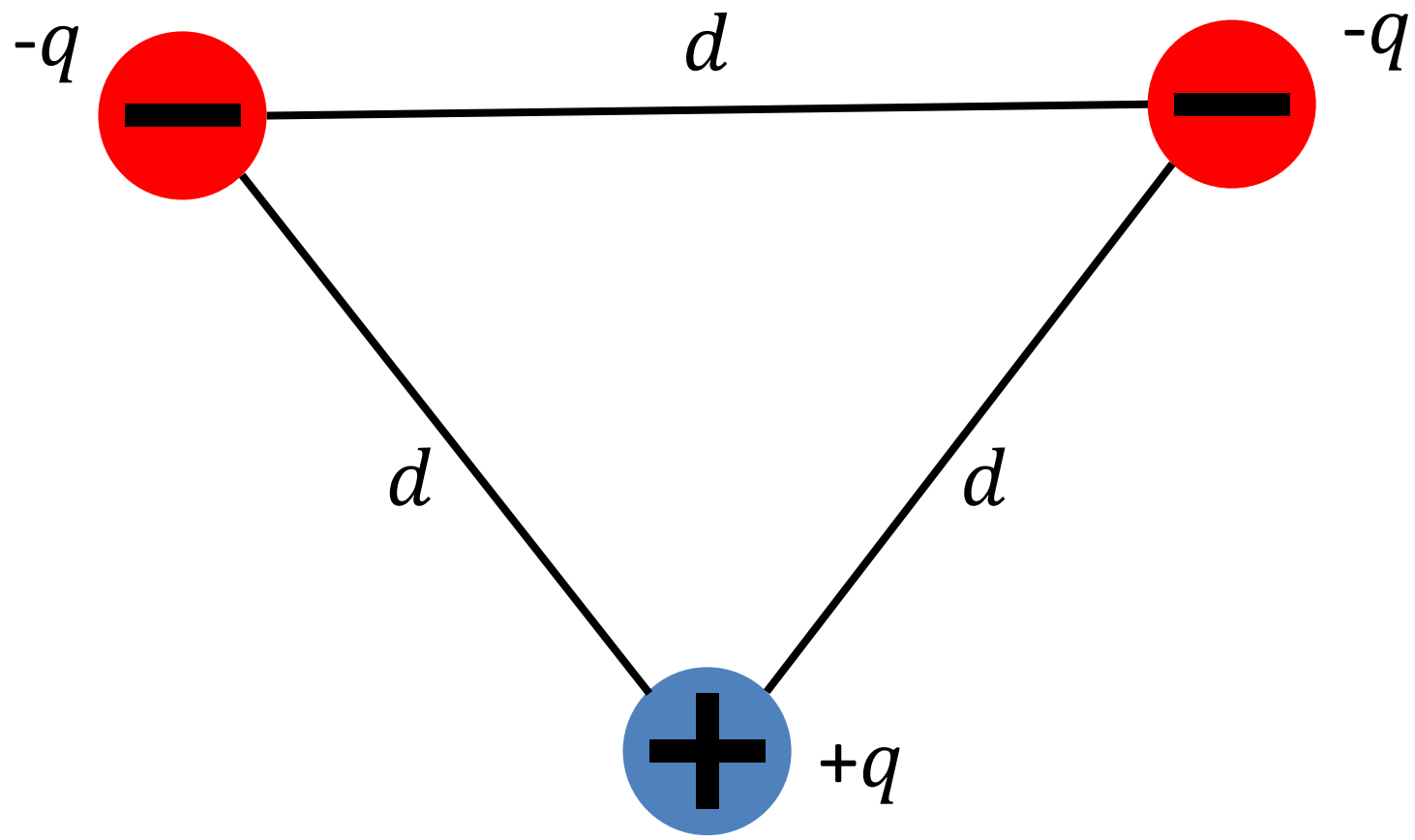
$$F = k\frac{Q_1 Q_2}{d^2}$$

$$E = \frac{F}{q} \Longrightarrow E = \frac{k\frac{Qq}{d^2}}{q}$$

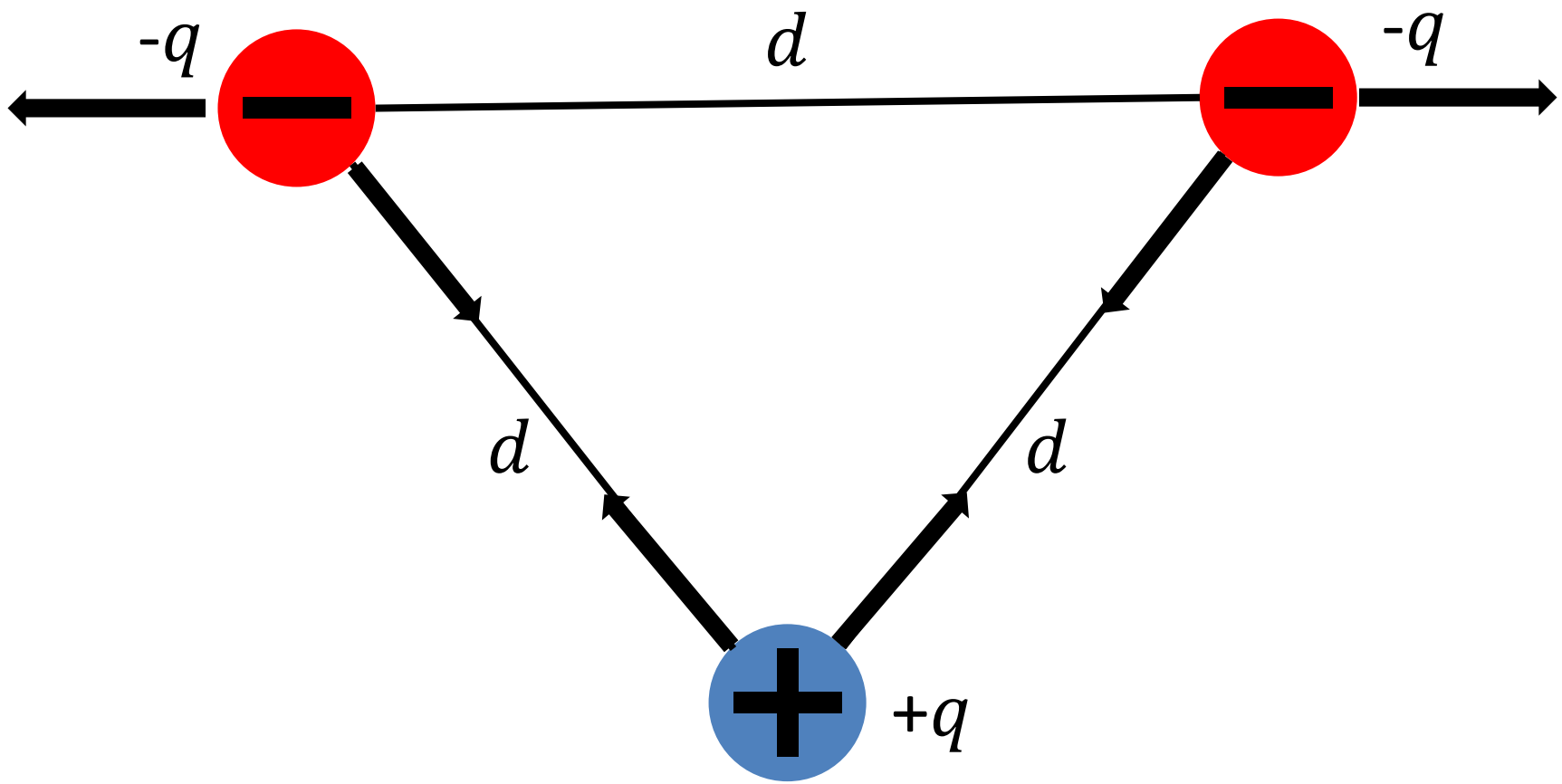
$$\boxed{E = k\frac{Q}{d^2}}$$

k=9.10^9 N.m^2/C^2

Sistema de cargas



Sistema de cargas



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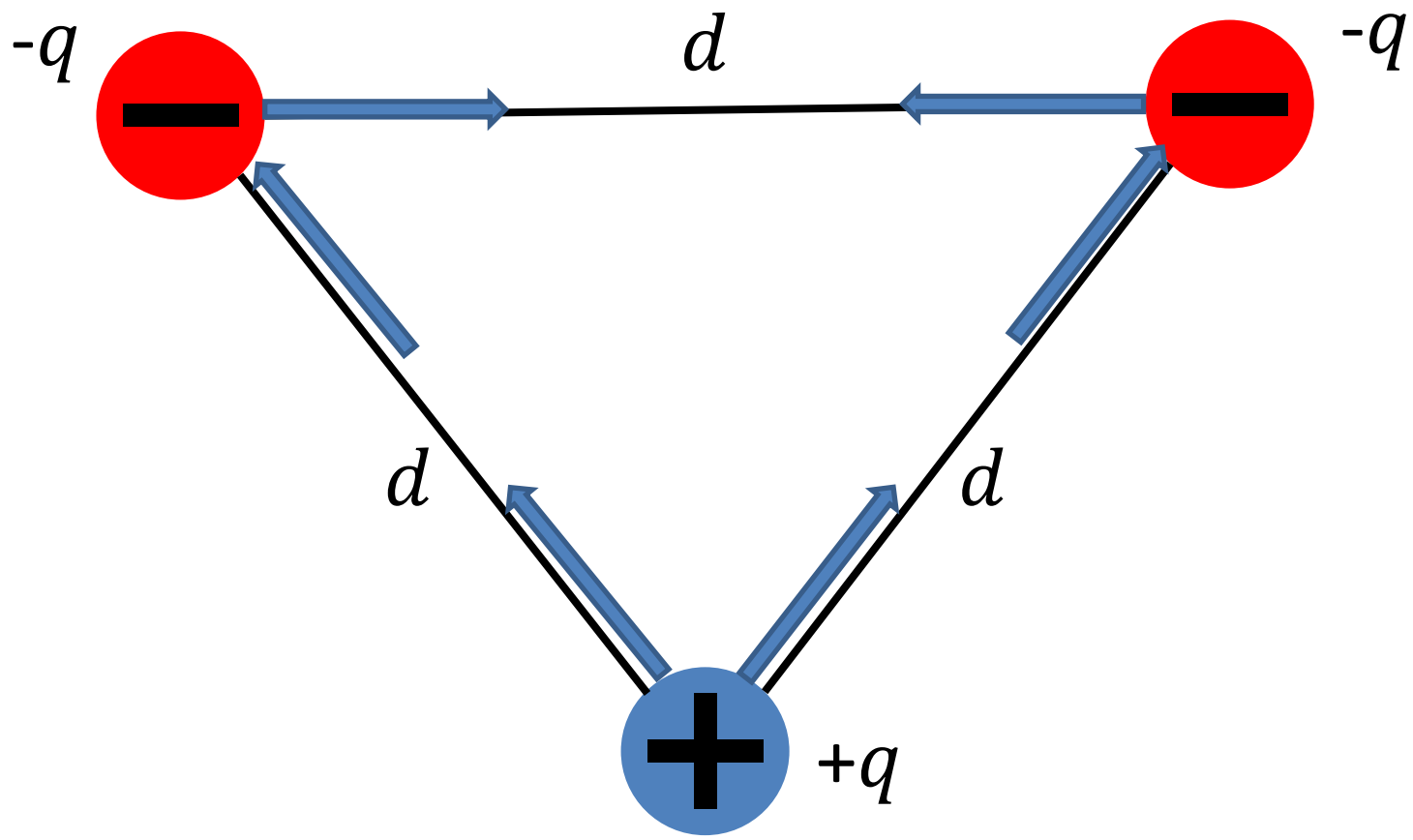
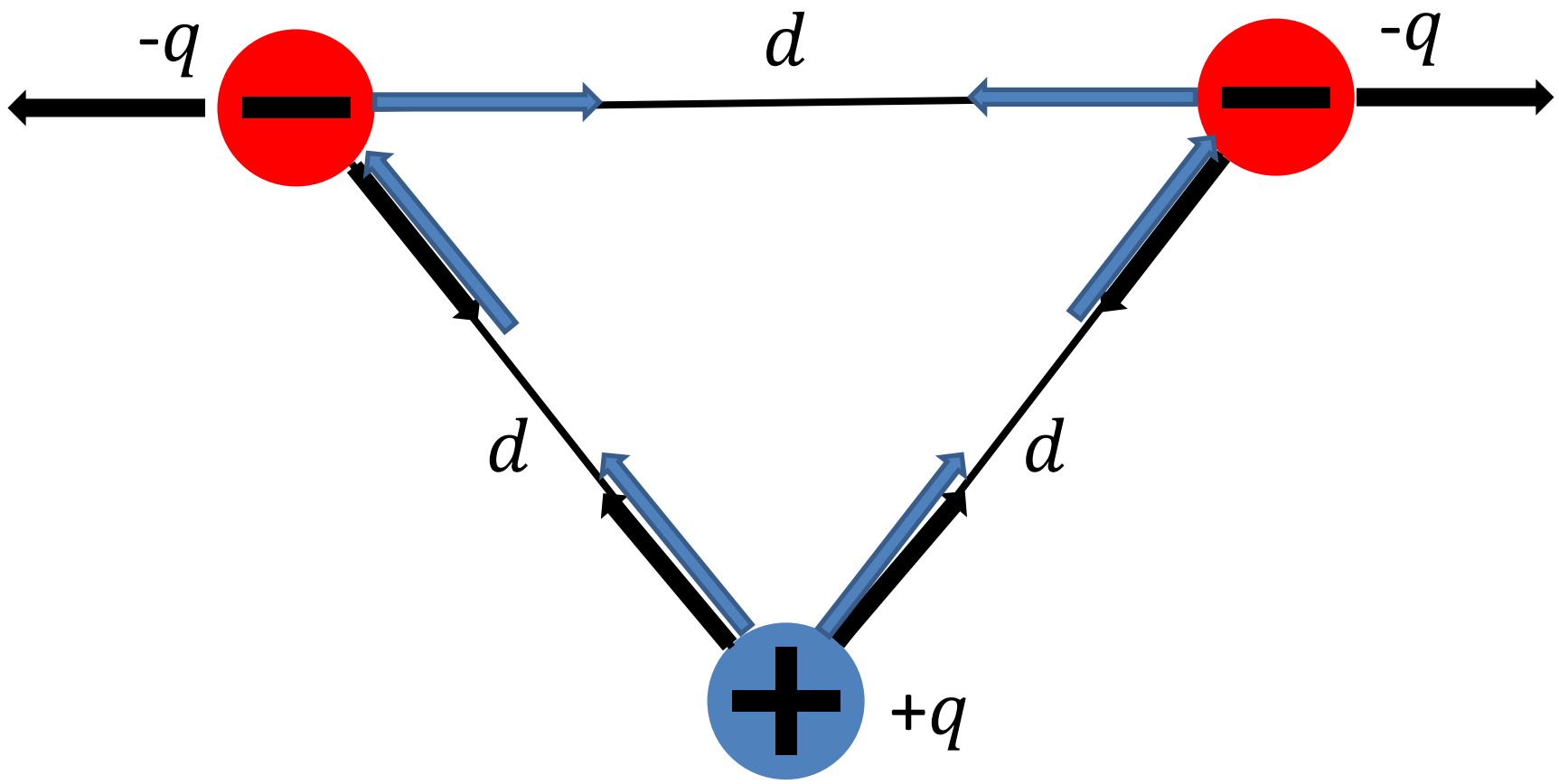
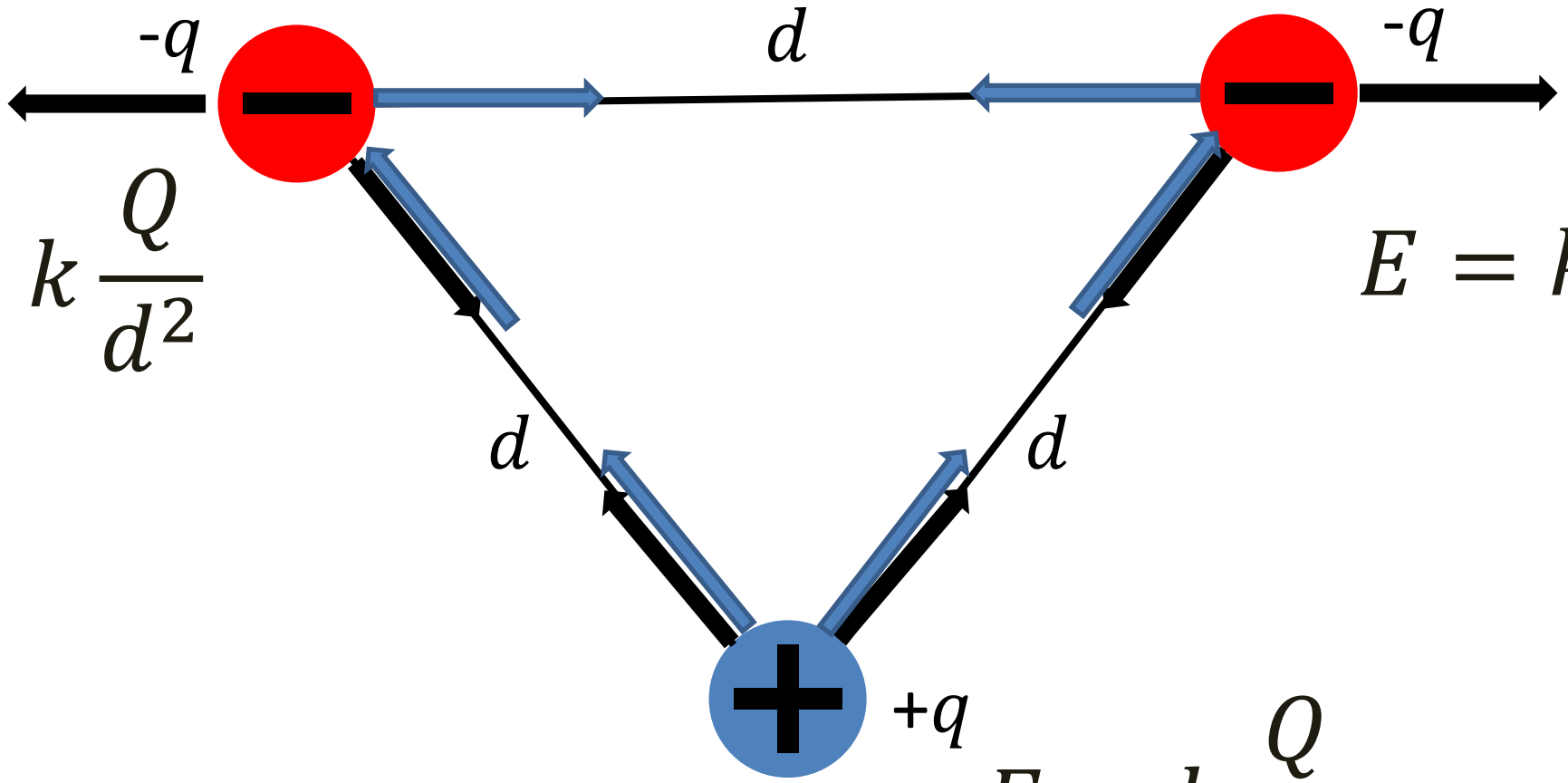


Sistema de cargas



Sistema de cargas



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

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Exercício 01

(UEA-AM)

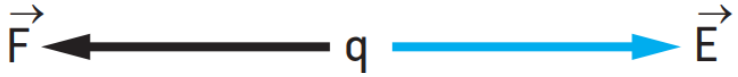
Duas cargas elétricas puntiformes, Q e q, sendo Q positiva e q negativa, são mantidas a certa distância uma da outra, conforme mostra a figura.

O vetor força elétrica (de módulo F), que a carga negativa q sofre, e o vetor campo elétrico (de módulo E), presente no ponto onde ela é fixada, estão corretamente representados por:

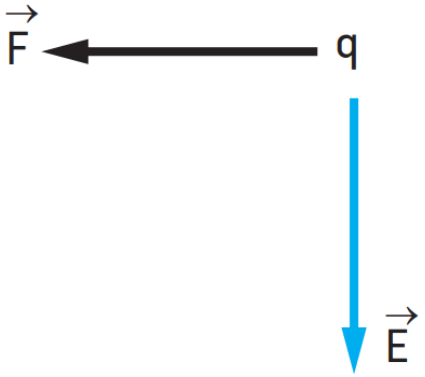
Exercício 01

a.

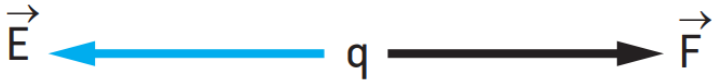
b.



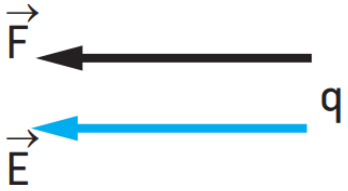
c.



d.



e.



Exercício 01

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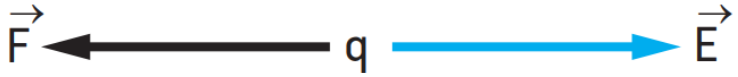
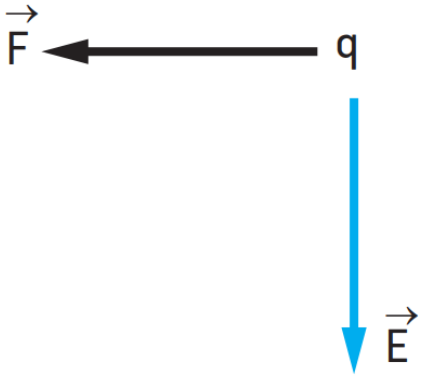
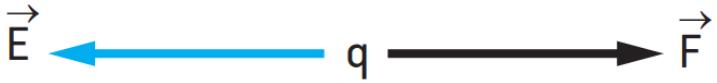
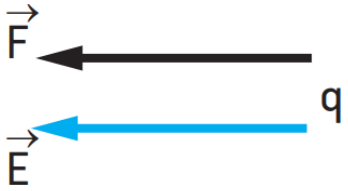
b. 

c. 

d. 

e. 

Resposta: B

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