

PHYS-F-205 - Electricité et magnétisme

Plan du cours

Electrostatique: forces - Hecht chapitre 17 (3 cours, 1h d'exercices)

- * Charge électrique
- * Force électrique
- * Champ électrique et théorème de Gauss

Electrostatique: énergie - chapitre 18 (2 cours, 1h d'exercices)

- * Potentiel
- * Capacité

Courant continu - chapitre 19 (2 cours, 2h d'exercices)

- * Piles
- * Résistance et loi d'Ohm
- * Circuits RC

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Plan du cours (suite)

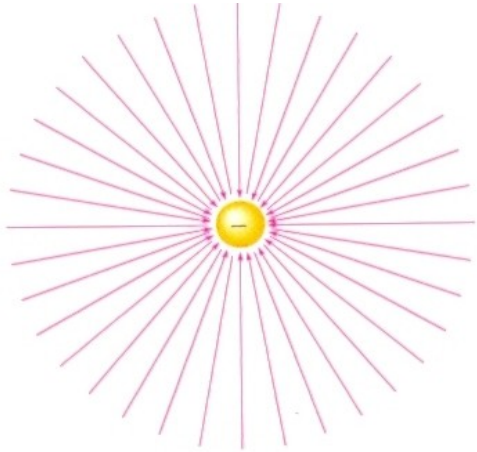
Magnétisme - chapitre 21 (3 cours, 4h d'exercices)

- * Aimants, champ magnétique
- * Electrodynamique et loi d'Ampère
- * Force magnétique

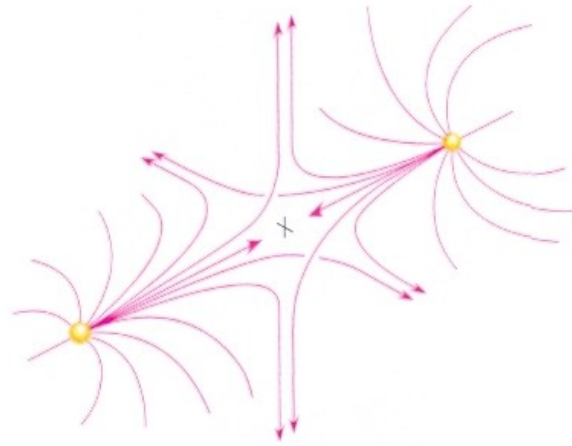
Induction électromagnétique - chapitres 22 et 24 (2 cours, 4h d'exercices)

- * Force électromotrice; lois de Faraday et de Lenz
- * Générateurs
- * Auto-induction
- * Rayonnement électromagnétique

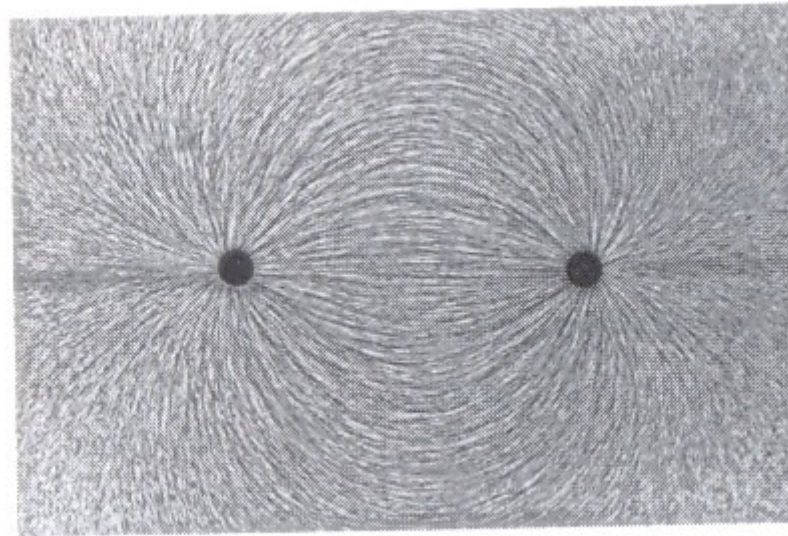
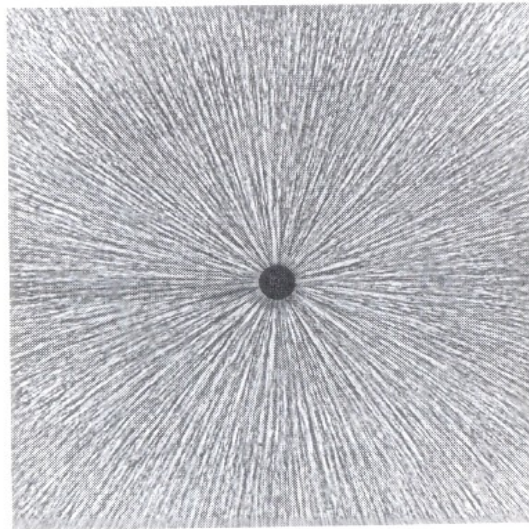
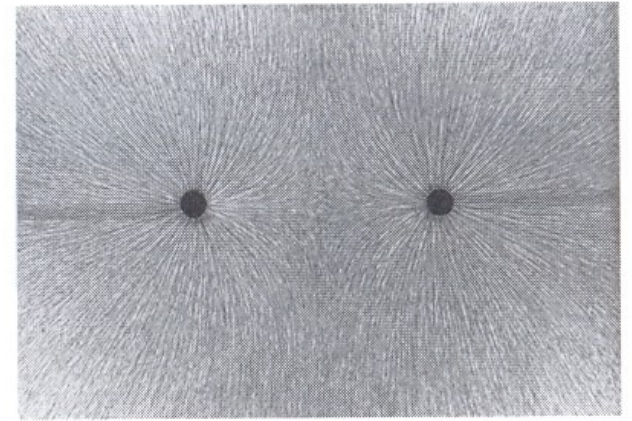
Lignes de champ électrostatique



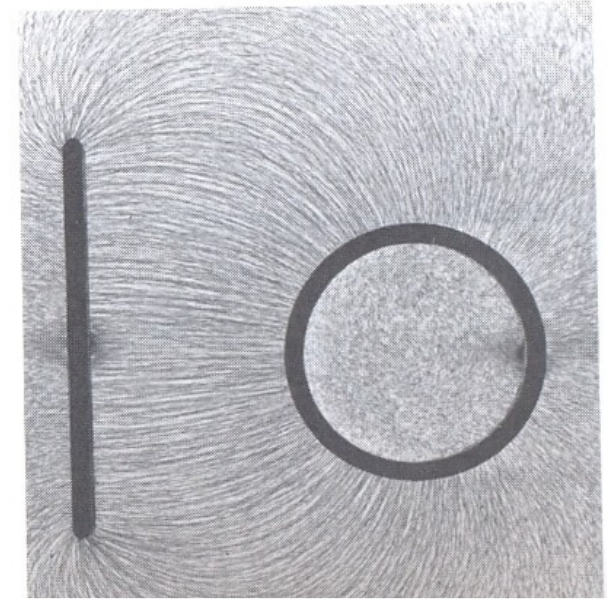
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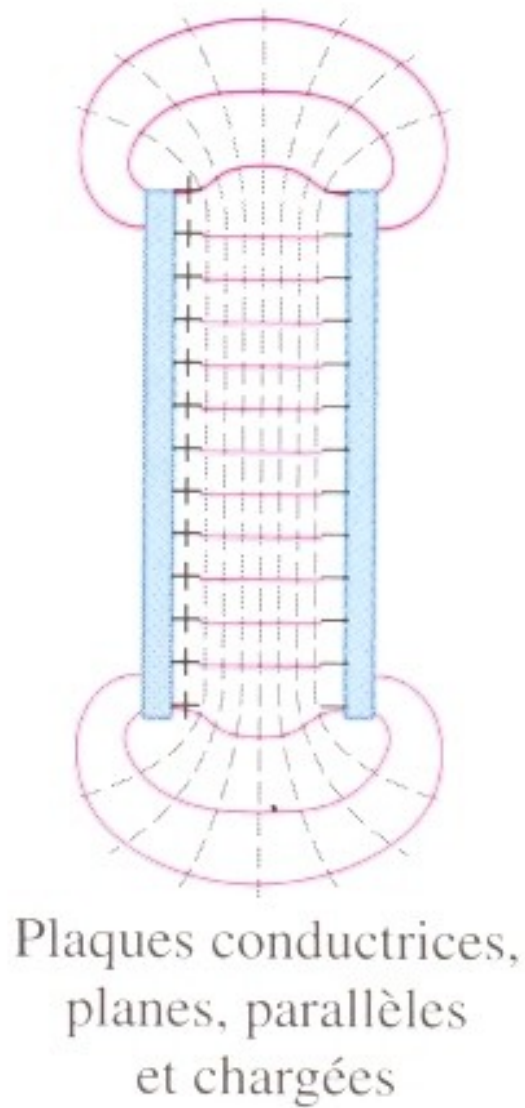
(a)



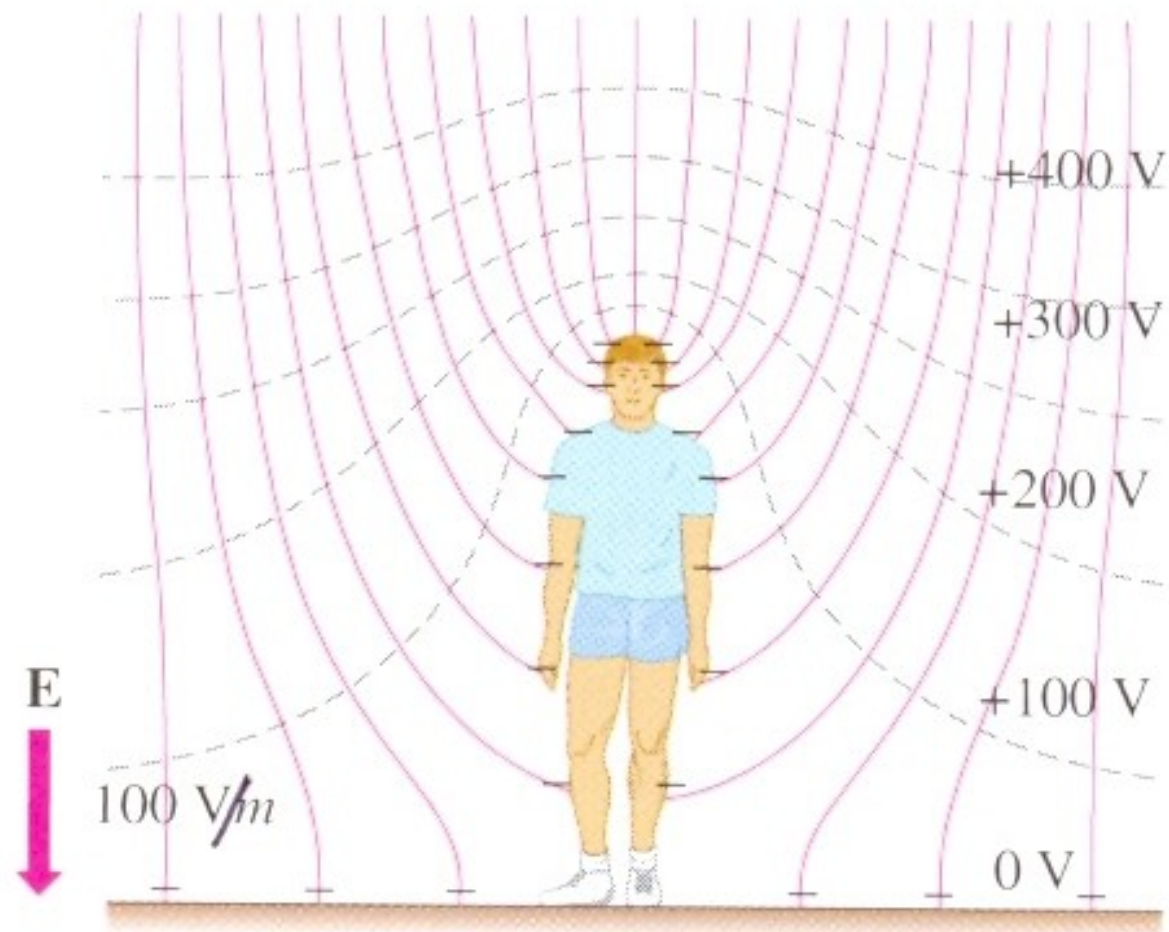
(b)



Lignes de champ et équipotentielles

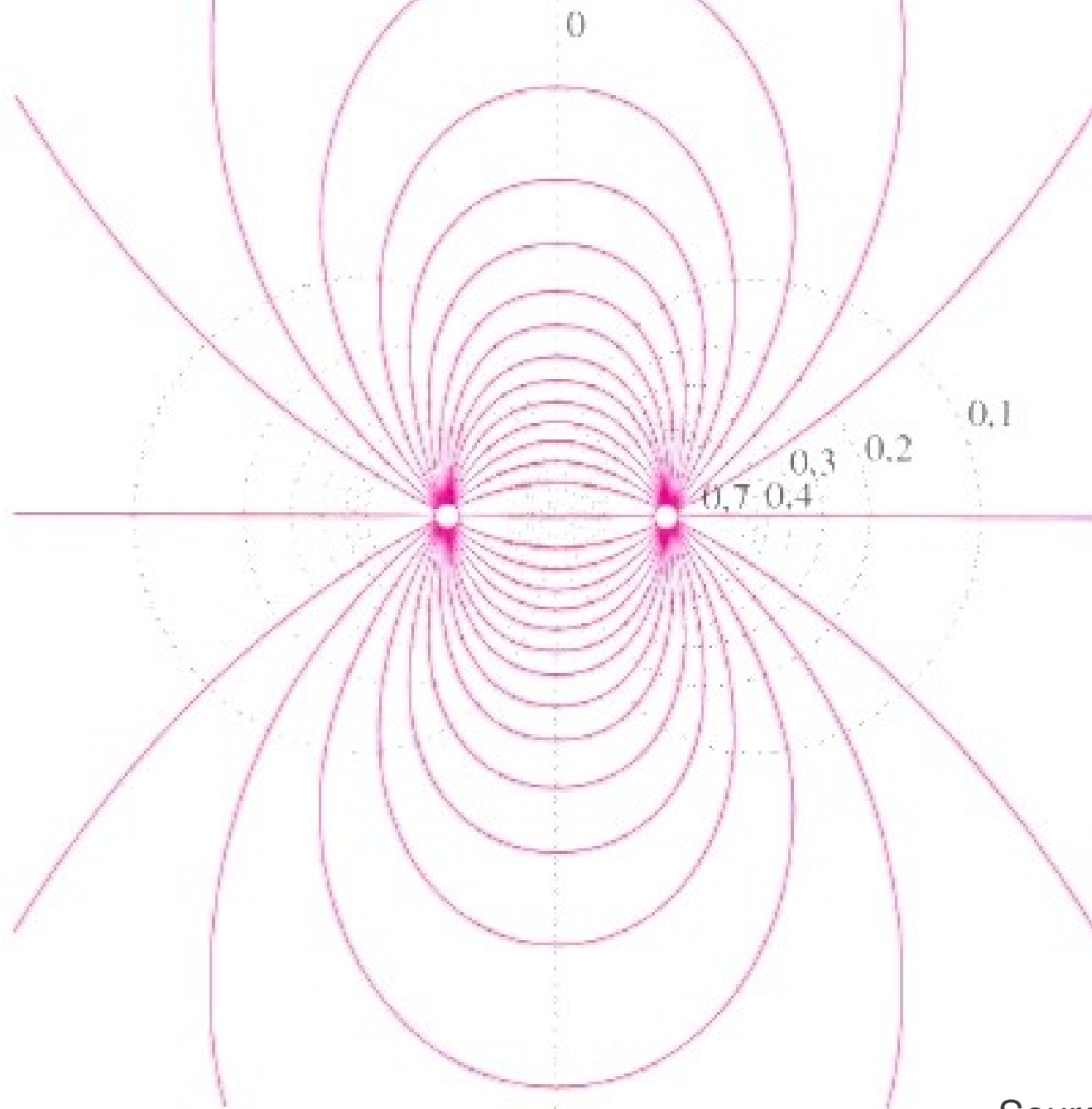


(a)



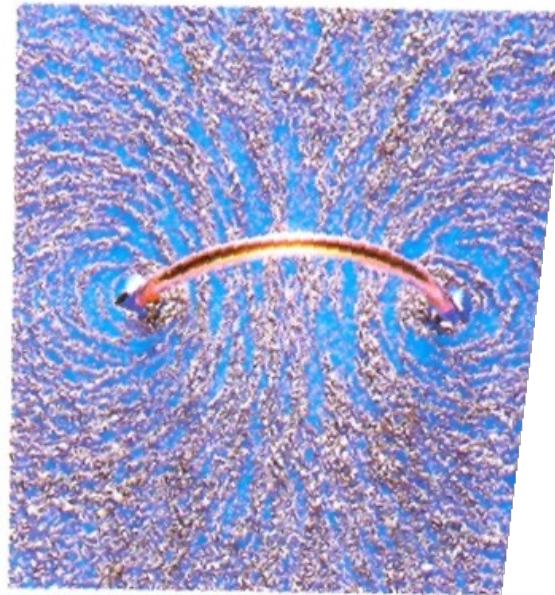
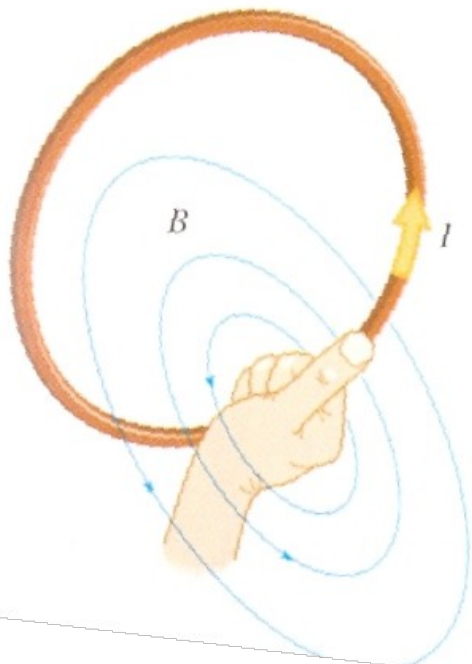
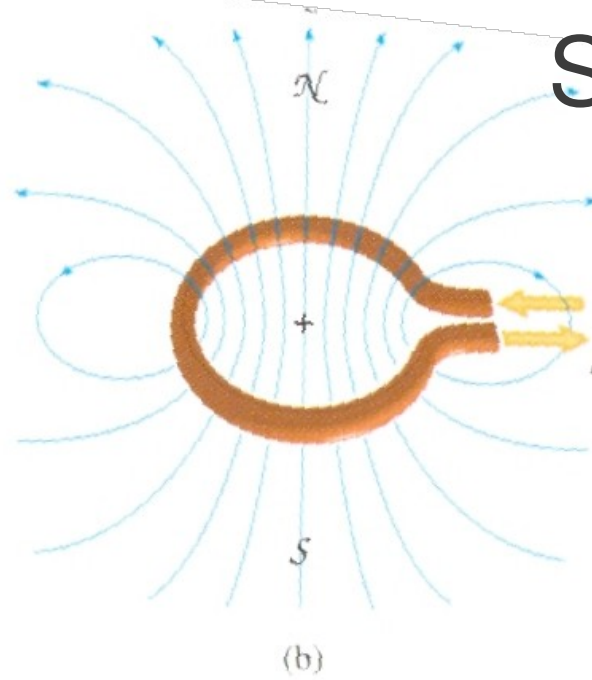
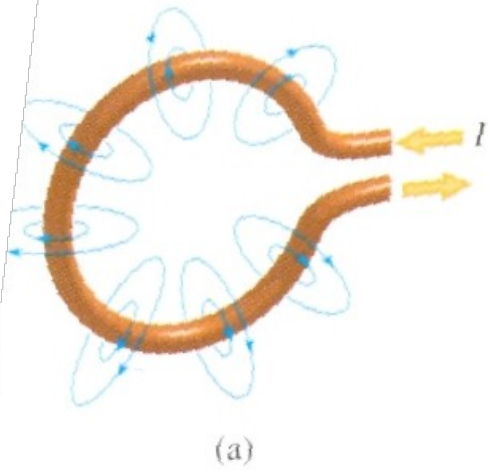
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Lignes de champ et équipotentielles



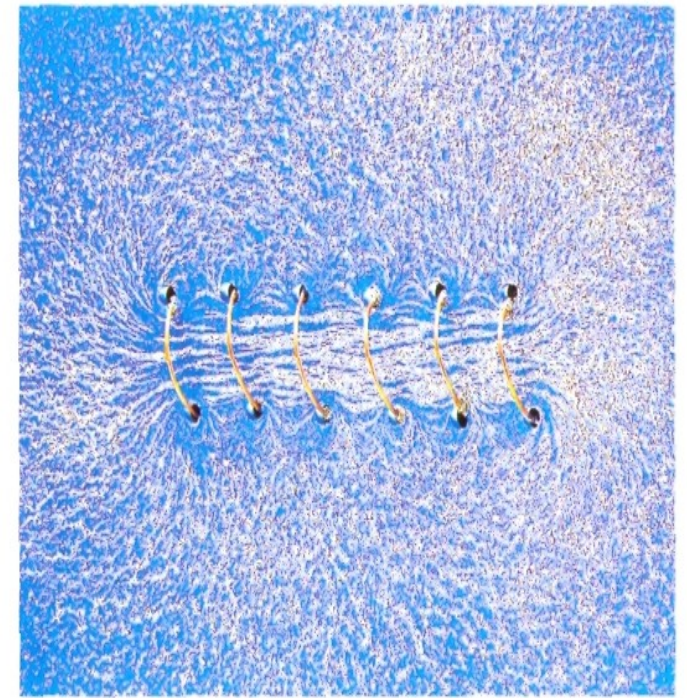
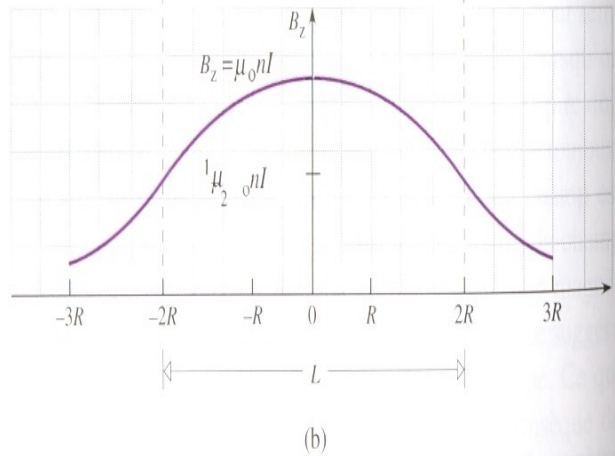
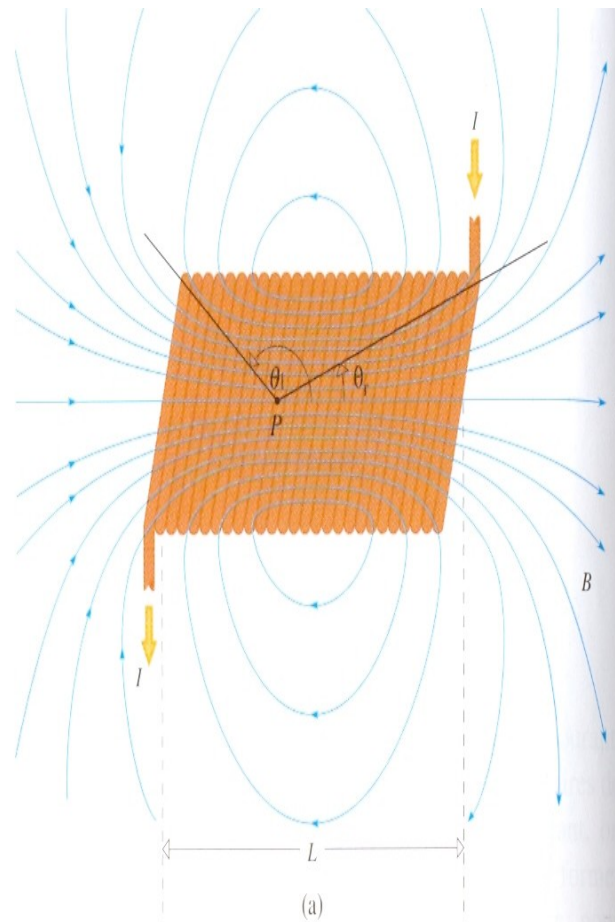
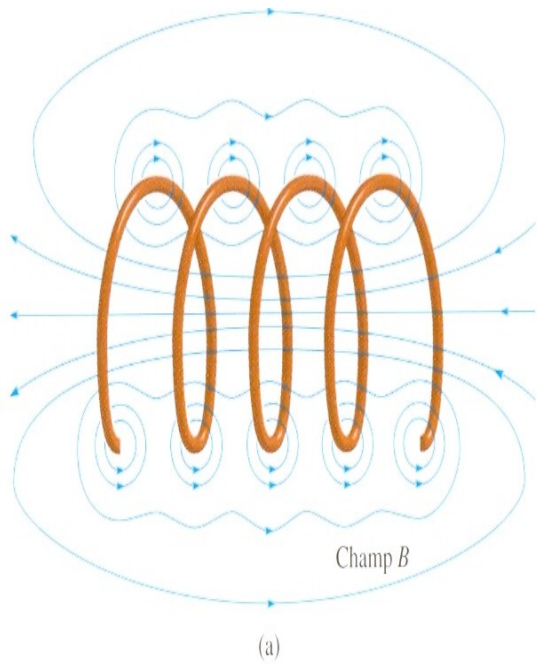
Source: E.Hecht

Spire de courant



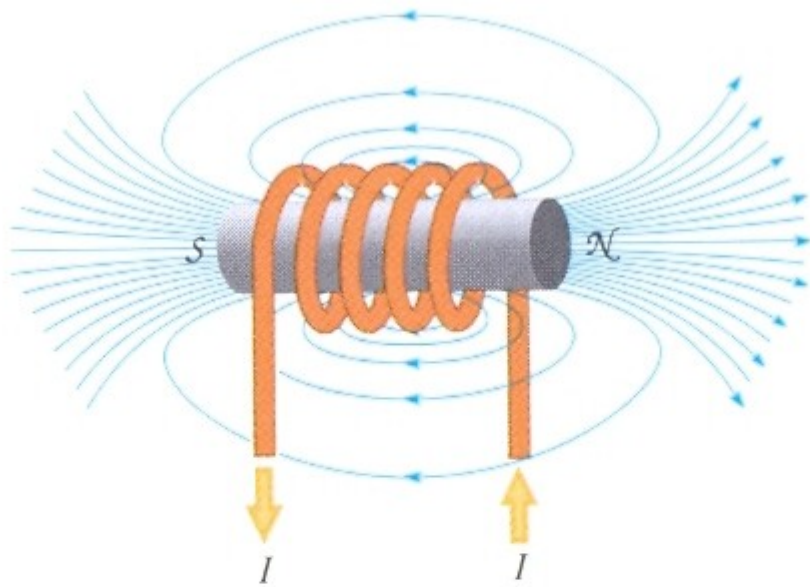
(d)

Source: E.Hecht

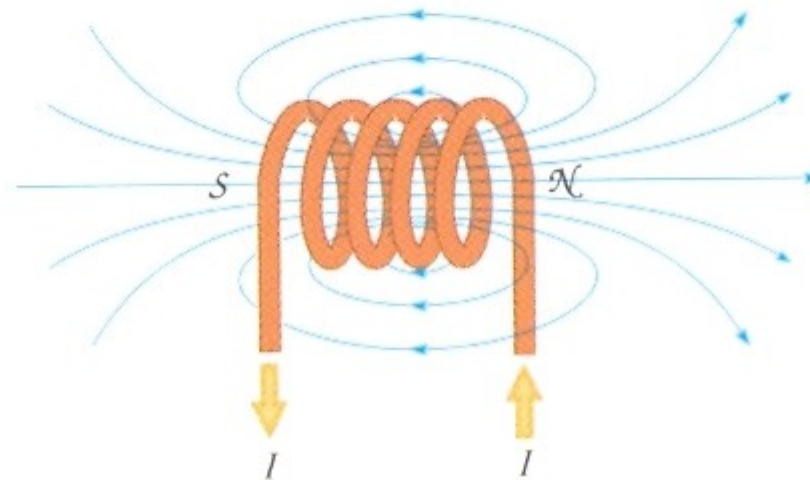


Solénoïde

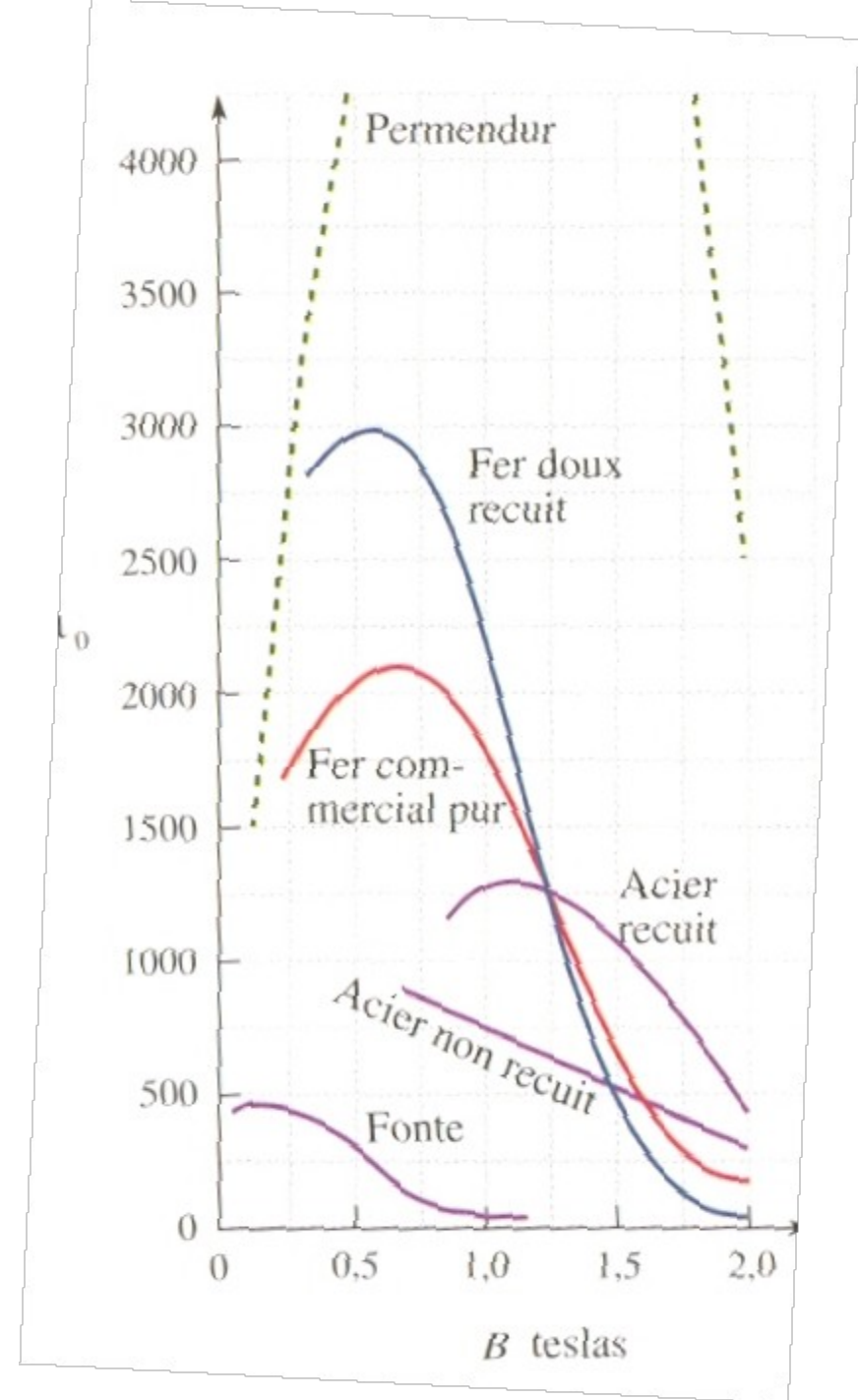
Source: E.Hecht



(a)



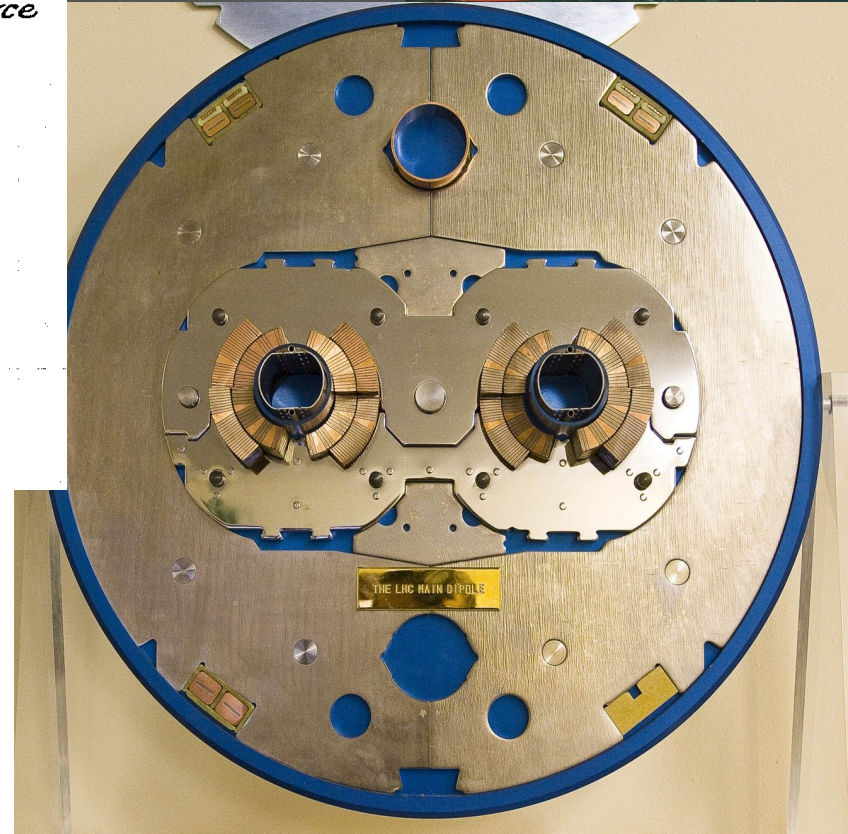
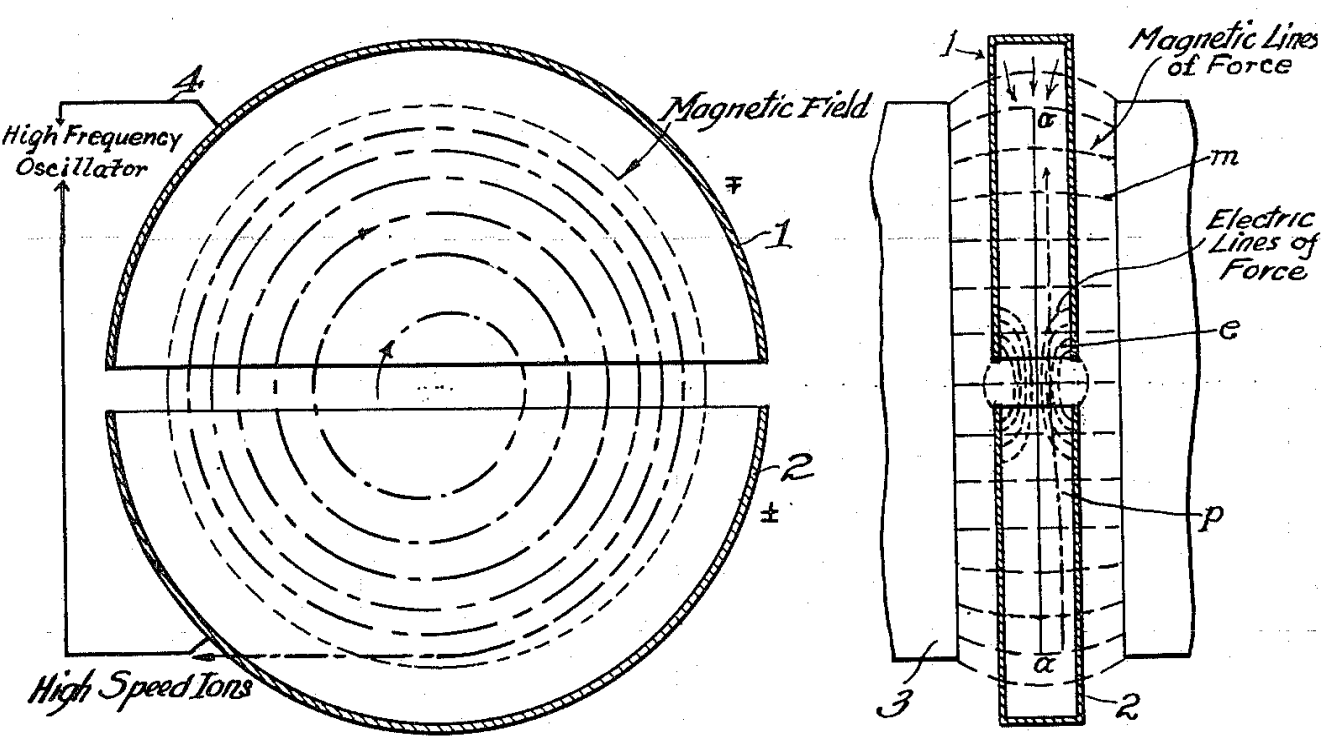
Magnétisation



Source: E.Hecht

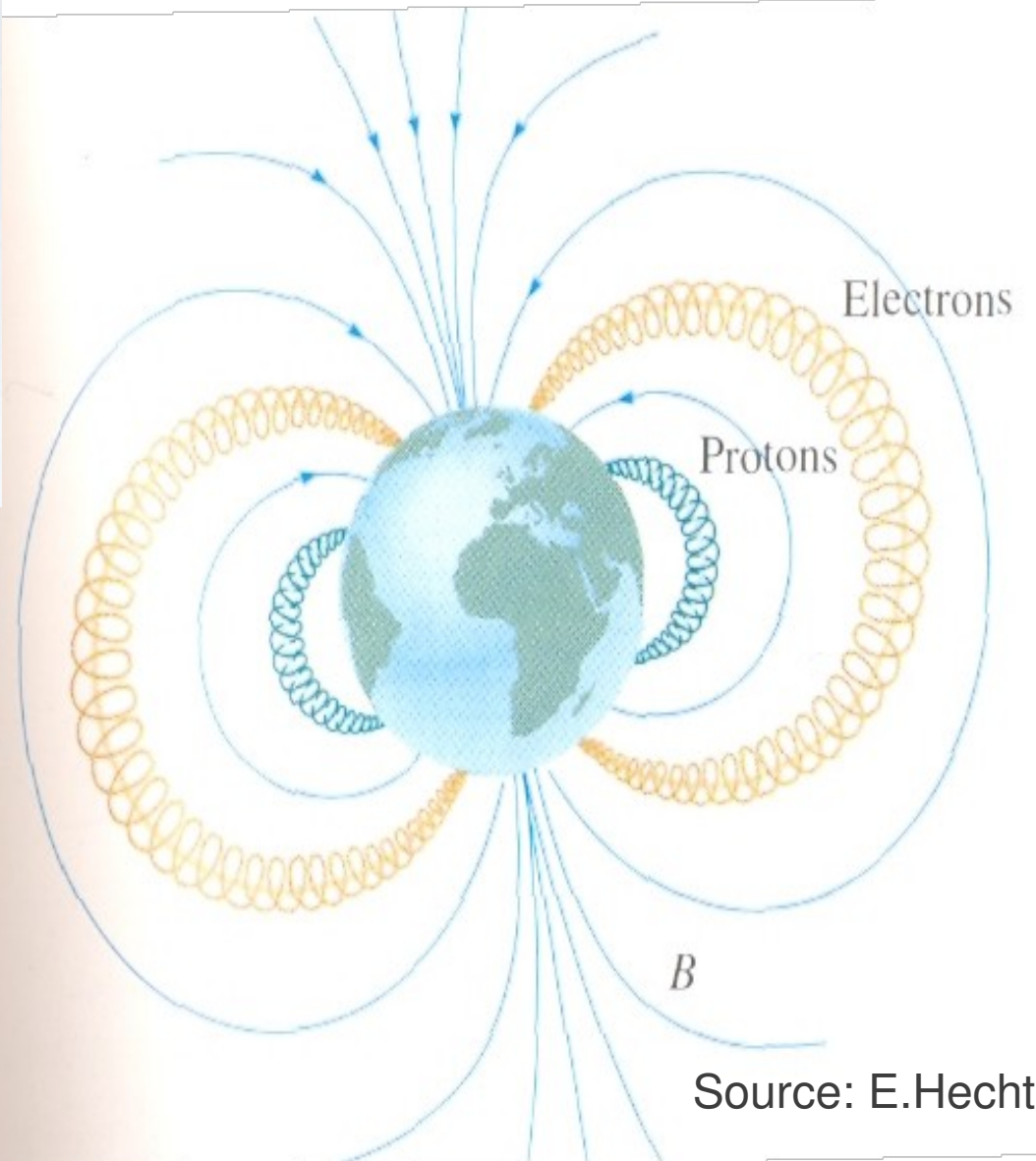
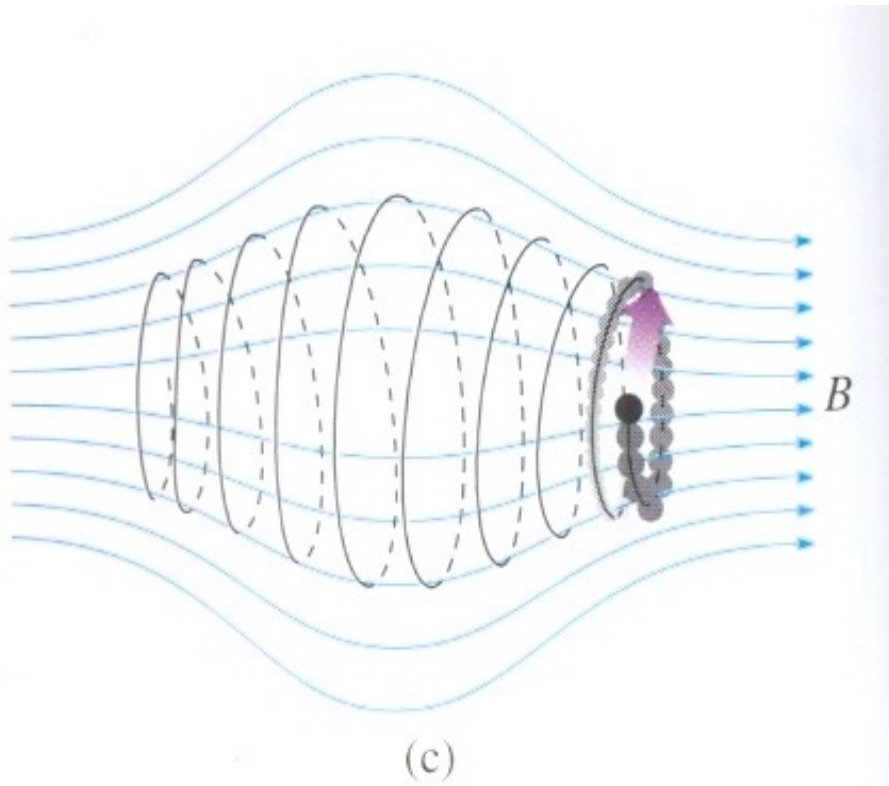
Accélérateurs de particules

E. Lawrence, 1930



Sources: Wikipedia, CERN

Confinement magnétique



Réacteurs de fusion (tokamak)

NB: bobine torique:
Plasma instable (pas vu au cours)

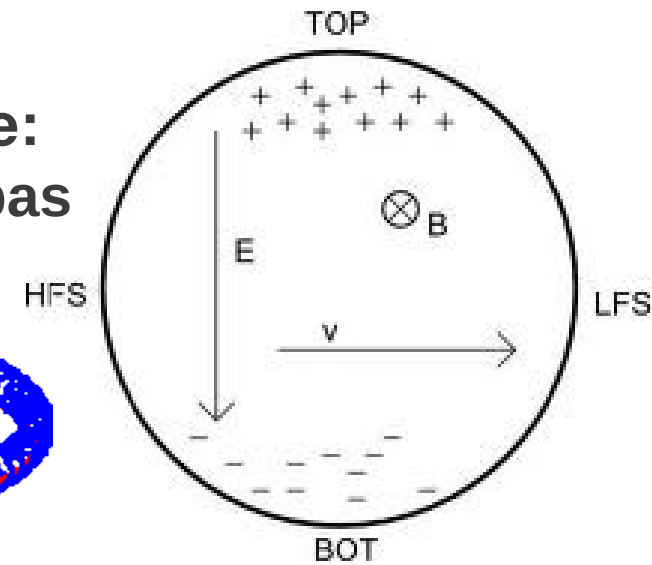
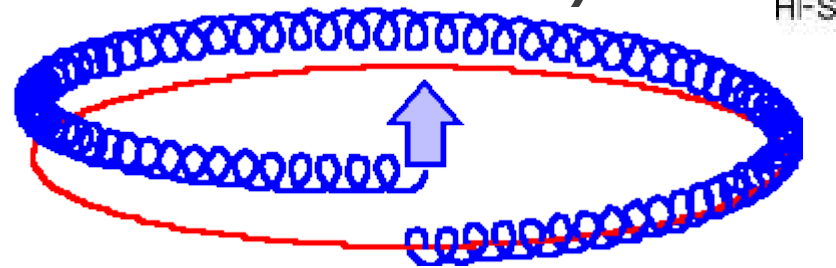
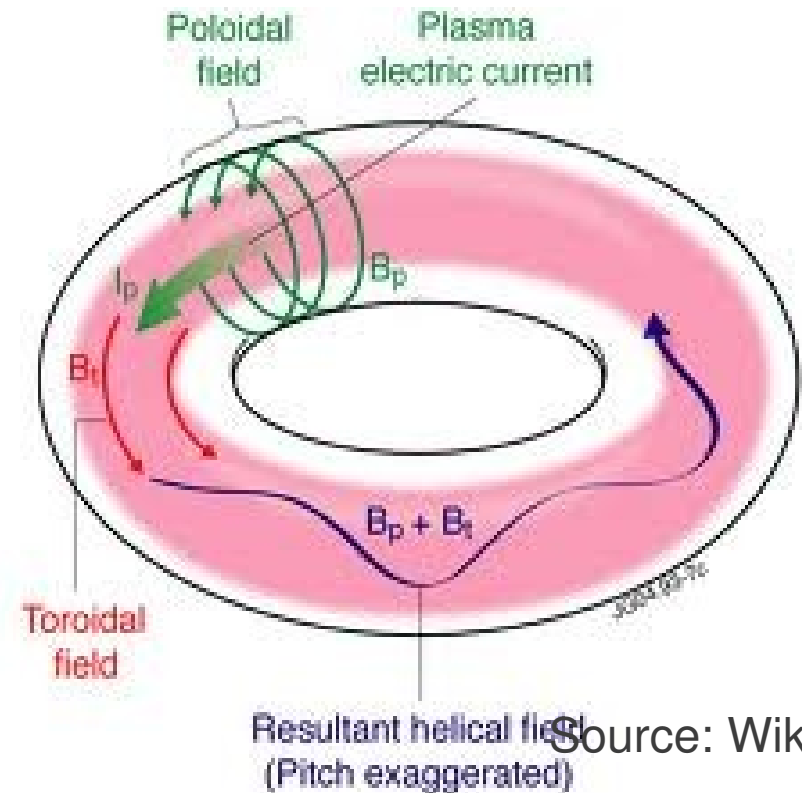
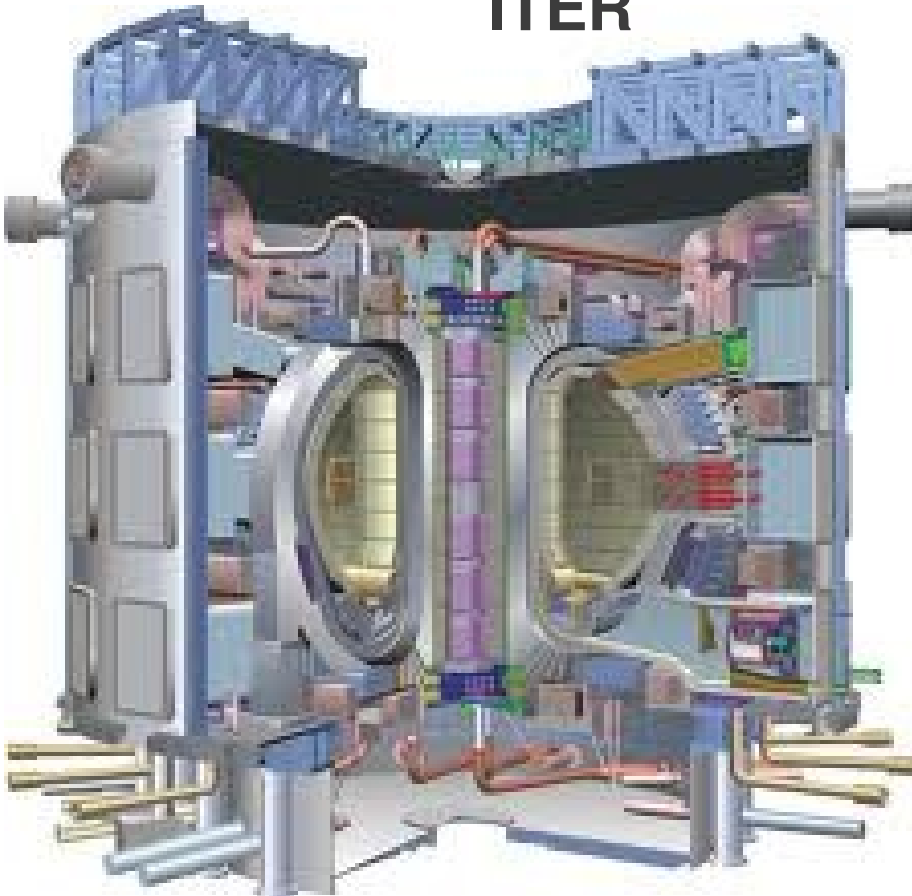


Fig. 3

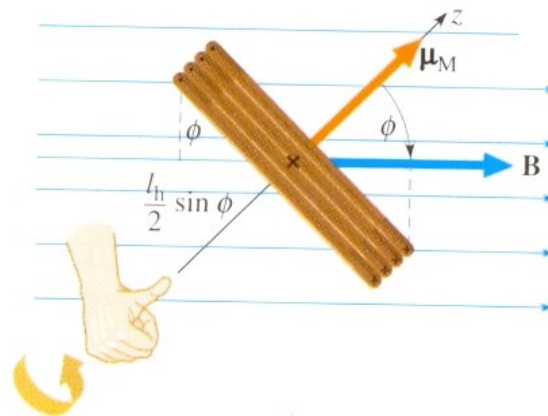
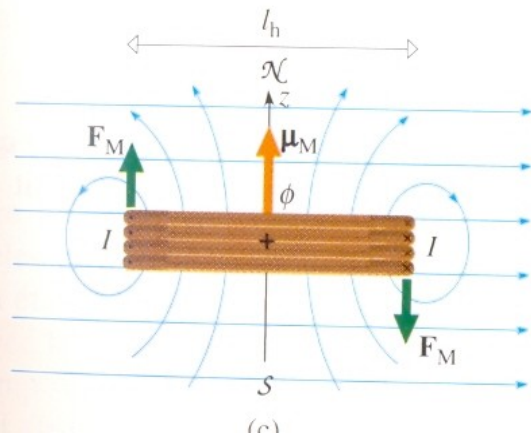
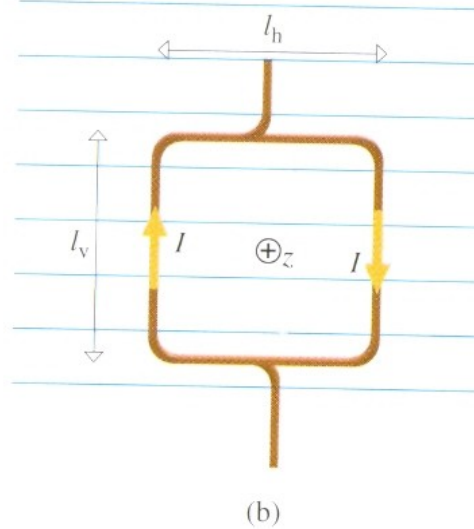
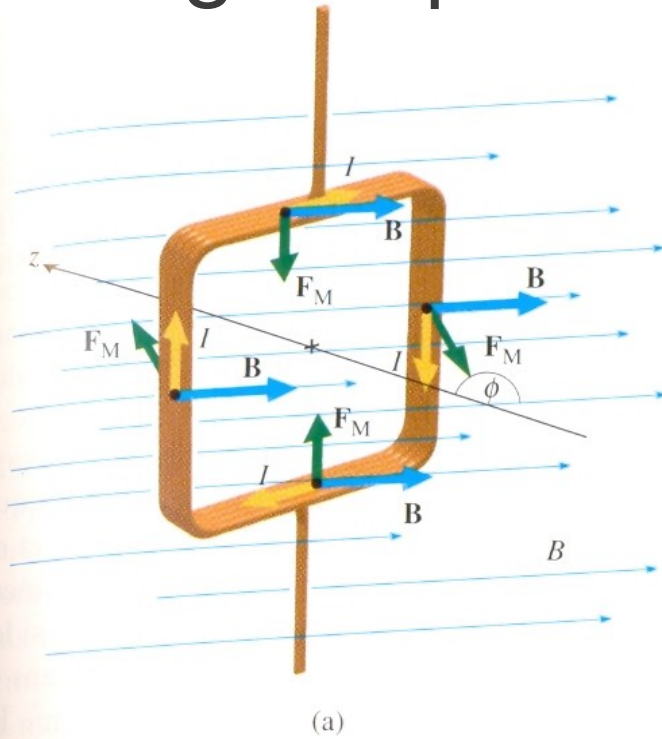
Poloidal cut through tokamak chamber with charge separation depicted.

ITER

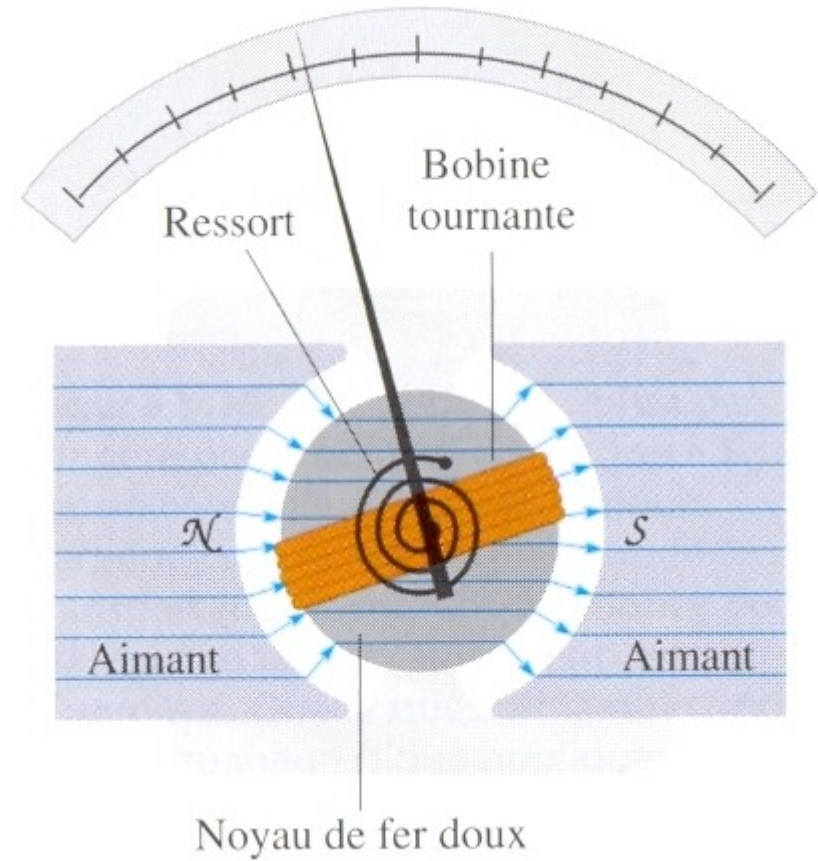


Source: Wikipedia

Moment dipolaire magnétique

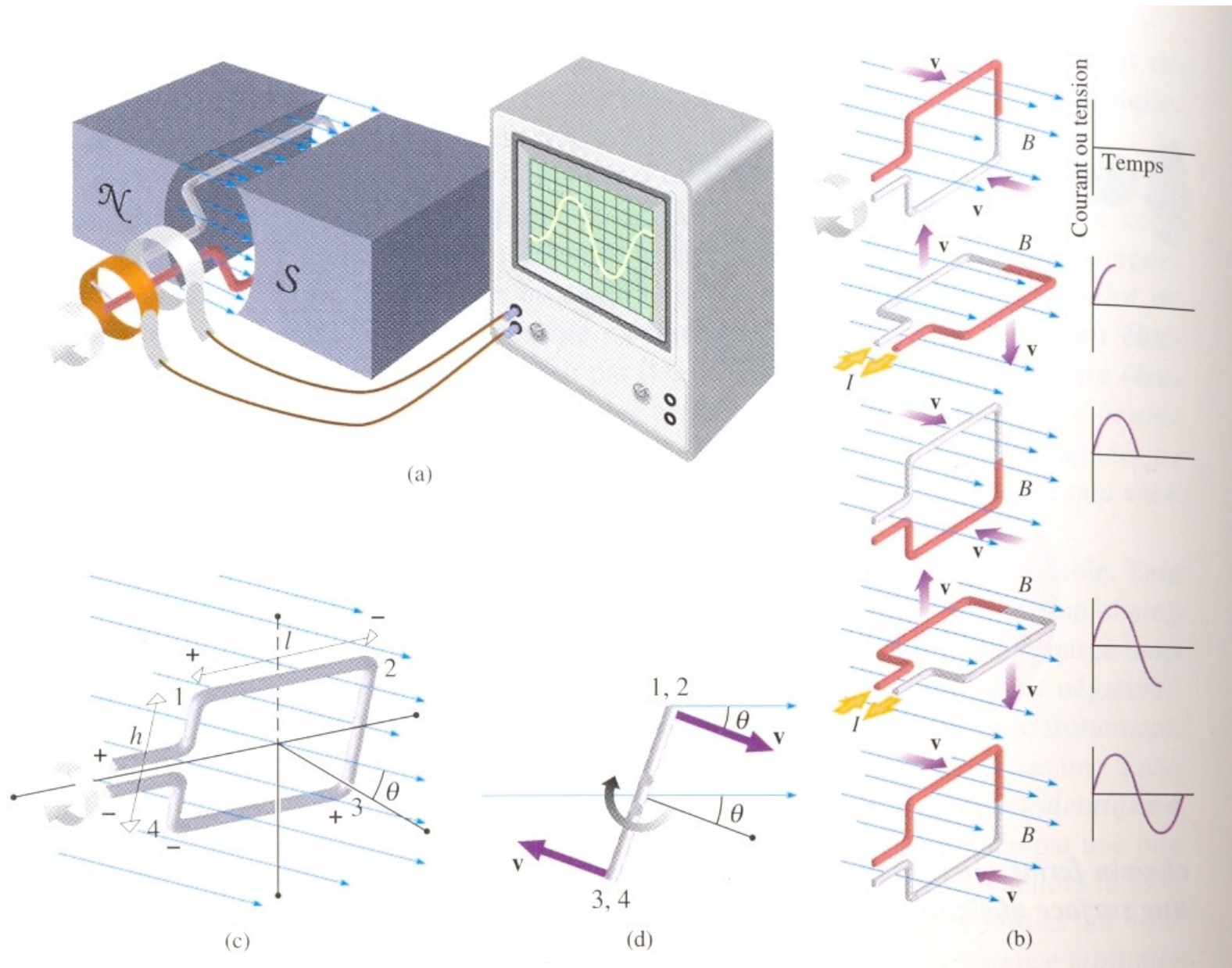


Galvanomètre à cadre mobile



Source: E.Hecht

Générateur de tension alternative



Source: E.Hecht

Alternateur



Source: Wikipedia

Redresseur à commutateur

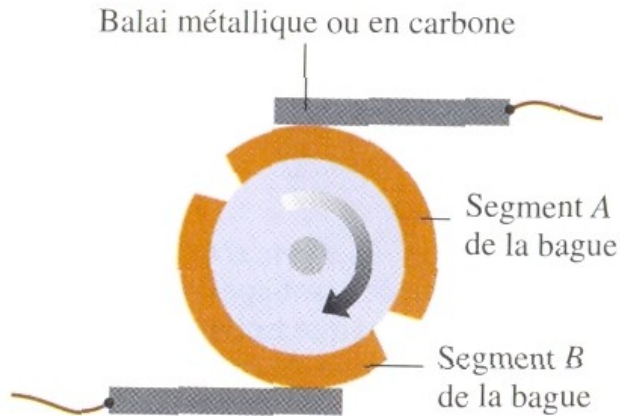
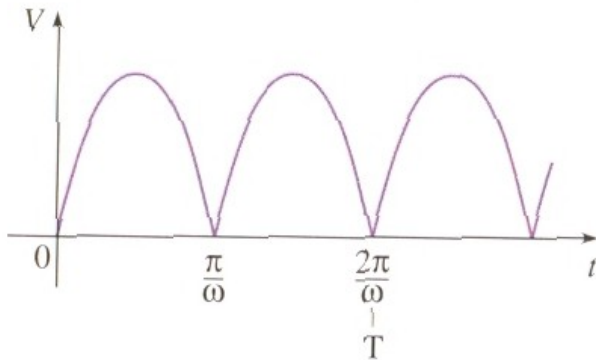


Figure 22.14 Un commutateur à deux segments. La figure représente l'instant où le balai supérieur touche le segment A et le balai inférieur touche le segment B. En tournant, le segment A se déplace et vient au contact avec le balai inférieur. En inversant le contact, le signal de sortie est inversé.



Redresseur à diode

