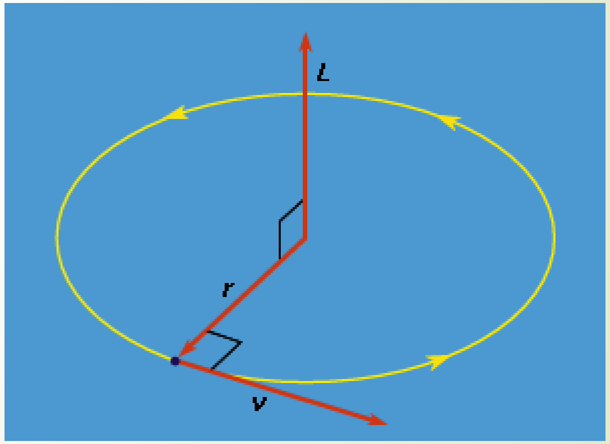
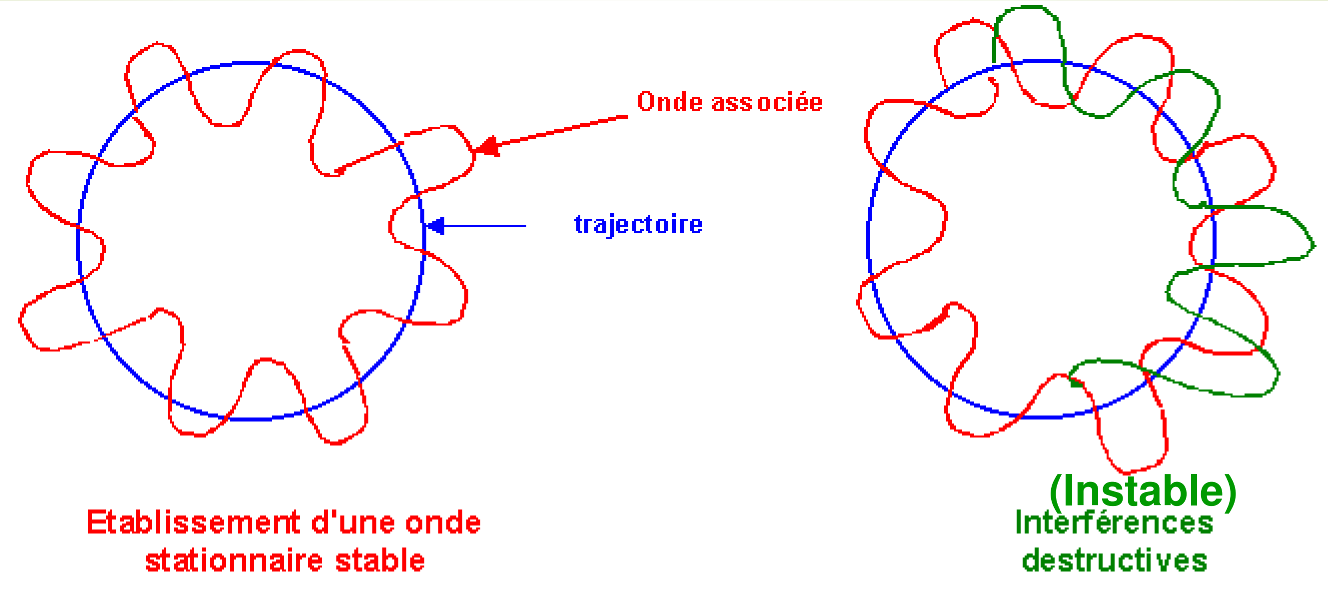
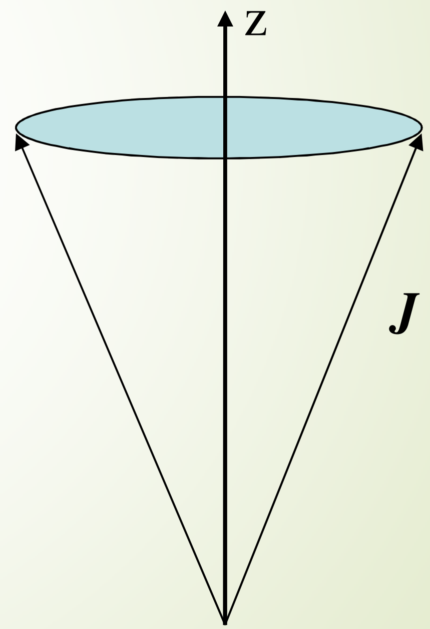
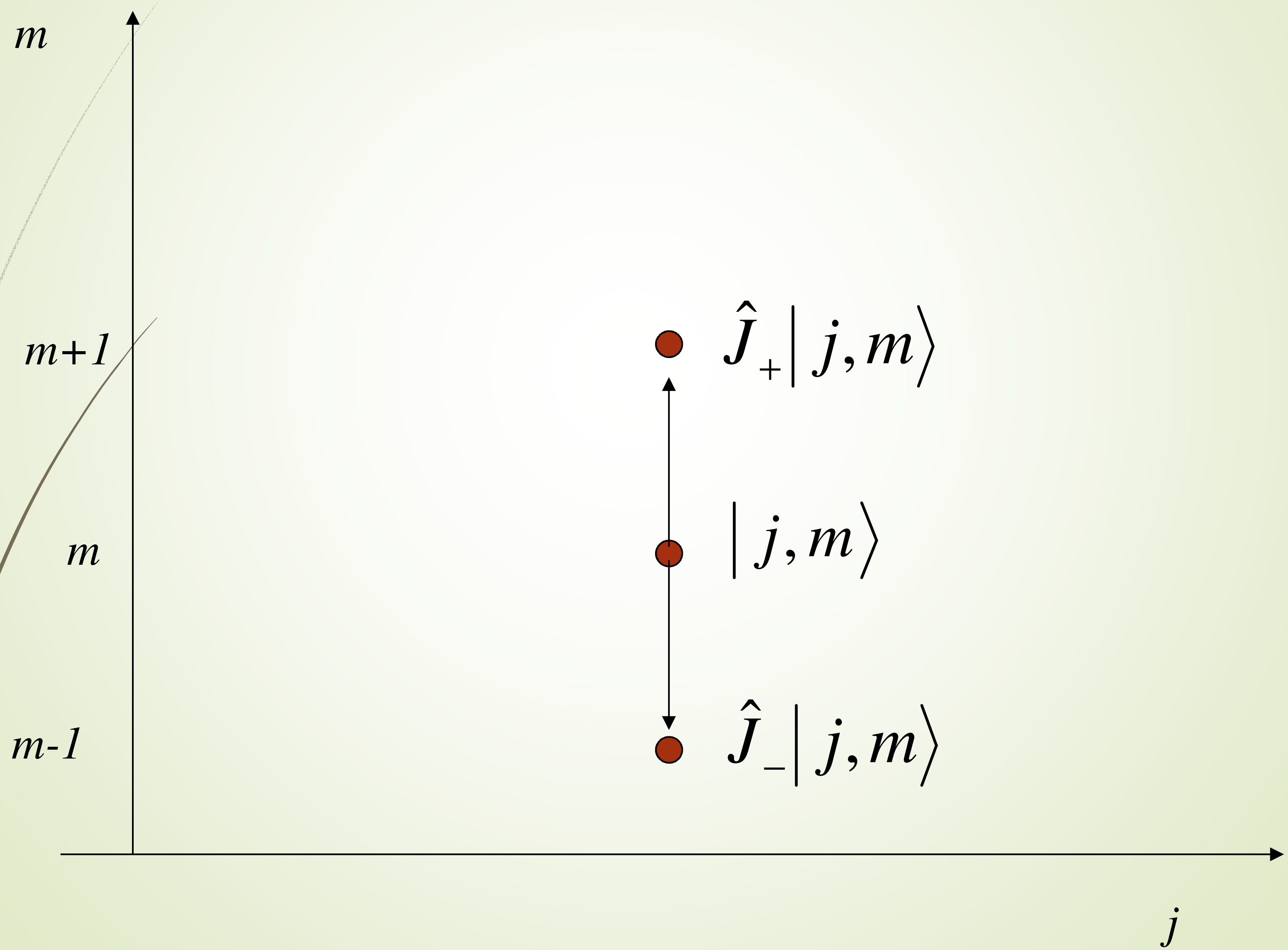
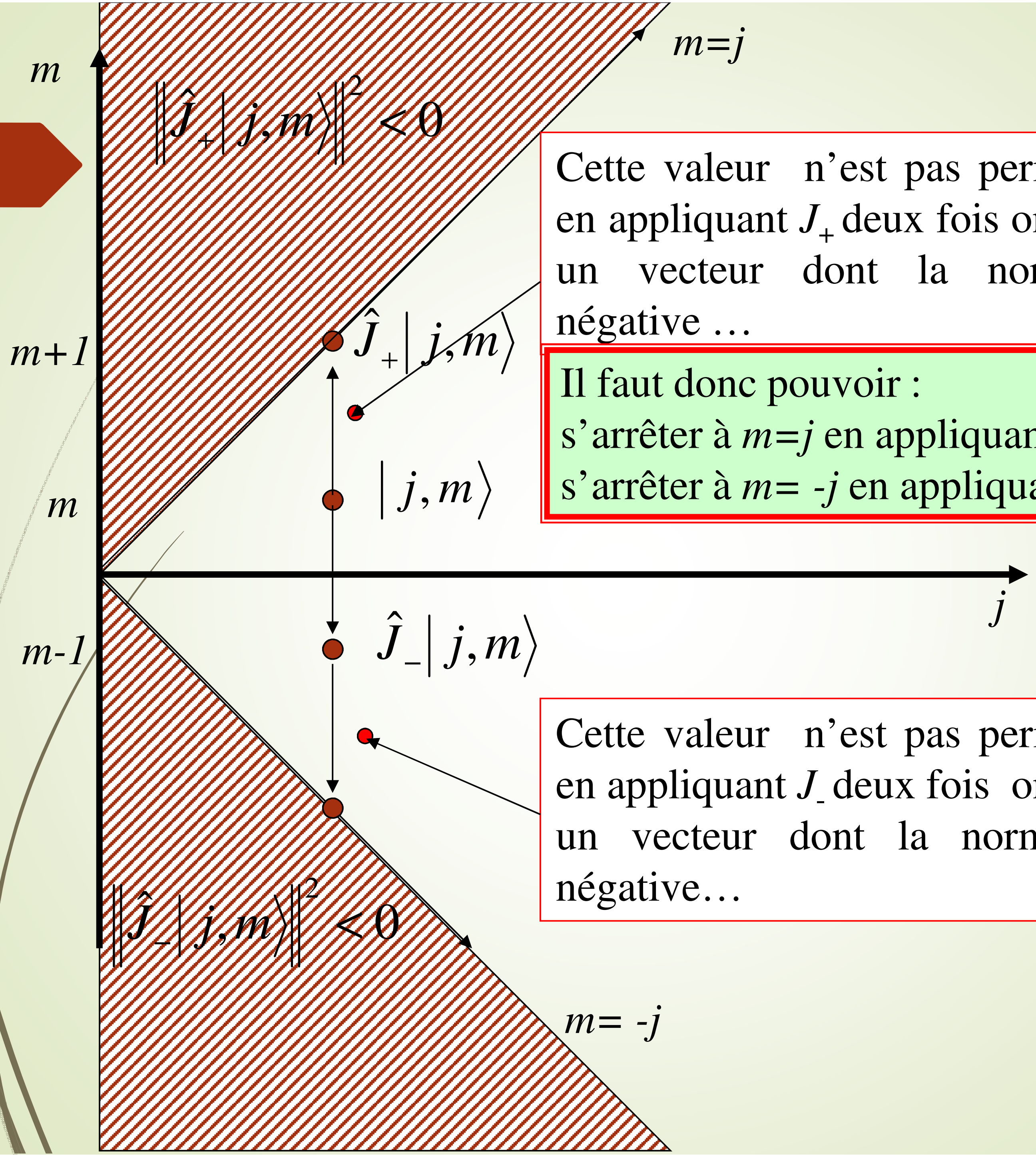


L
r
v


Onde associée
trajectoire
Etablissement d'une onde stationnaire stable
(Instable)
Interférences destructives


Z
J


m
m+1
m
m-1
$\hat{J}_+ | j,m \rangle$
$| j,m \rangle$
$\hat{J}_- | j,m \rangle$
j

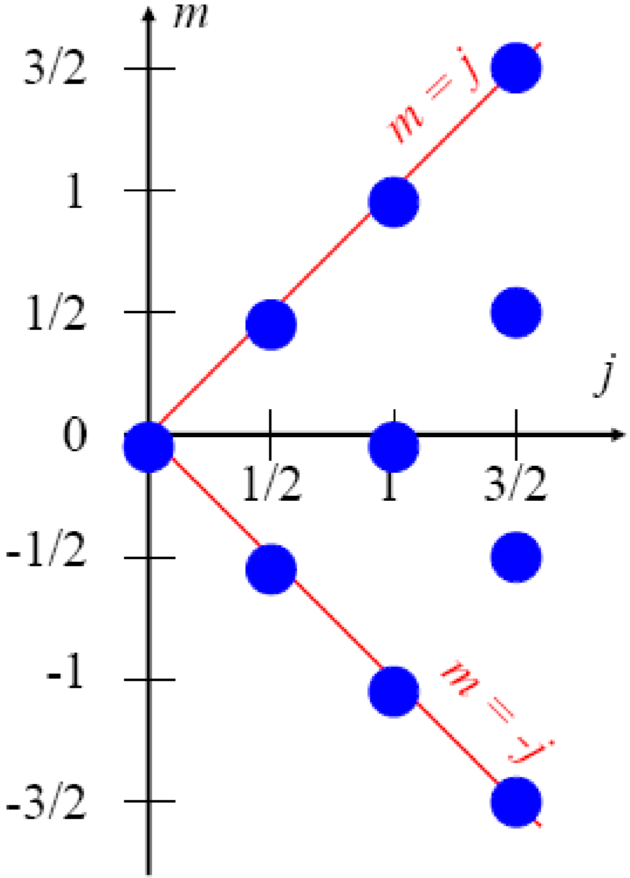


Cette valeur n'est pas permise car en appliquant J_+ deux fois on obtient un vecteur dont la norme est négative …

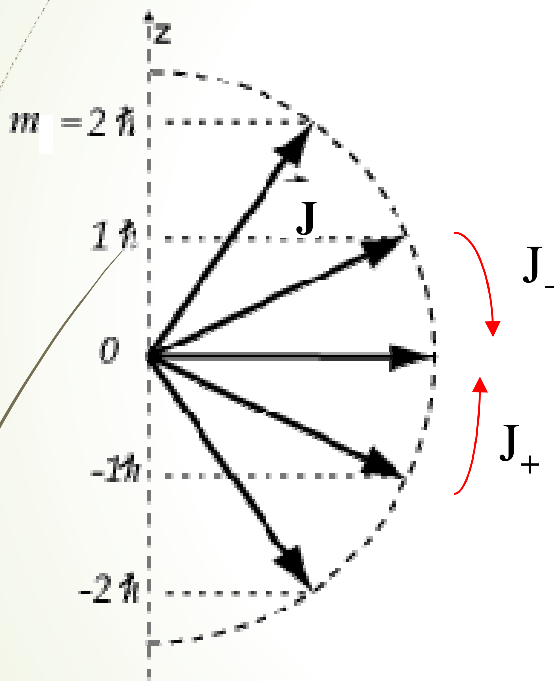
Il faut donc pouvoir :
s'arrêter à $m=j$ en appliquant J_+
s'arrêter à $m= -j$ en appliquant J_-

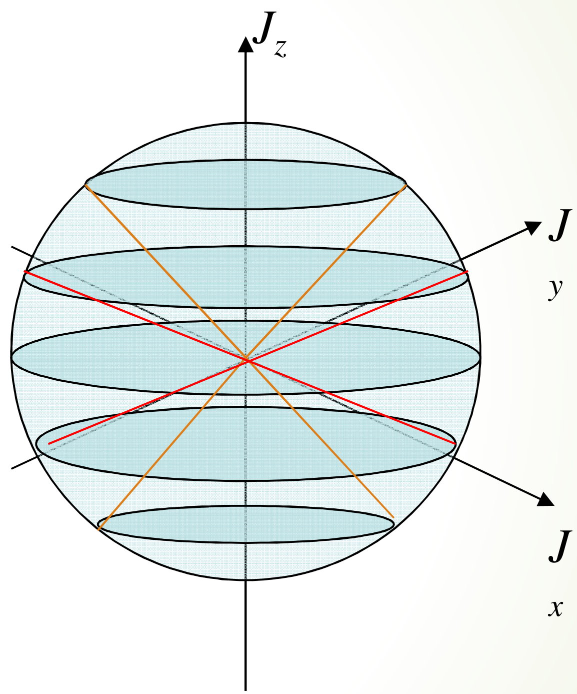
Cette valeur n'est pas permise car en appliquant J_- deux fois on obtient un vecteur dont la norme est négative…

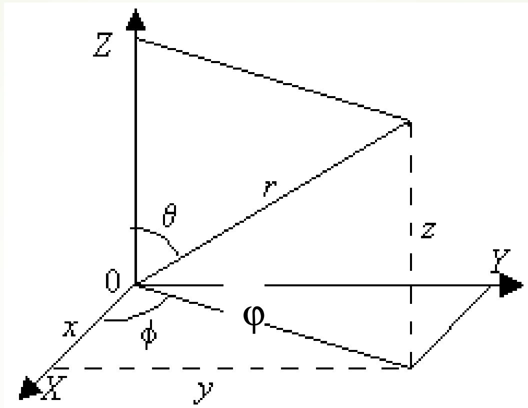
Les valeurs propres de $\hat{J}^2$ et $\hat{J}_z$



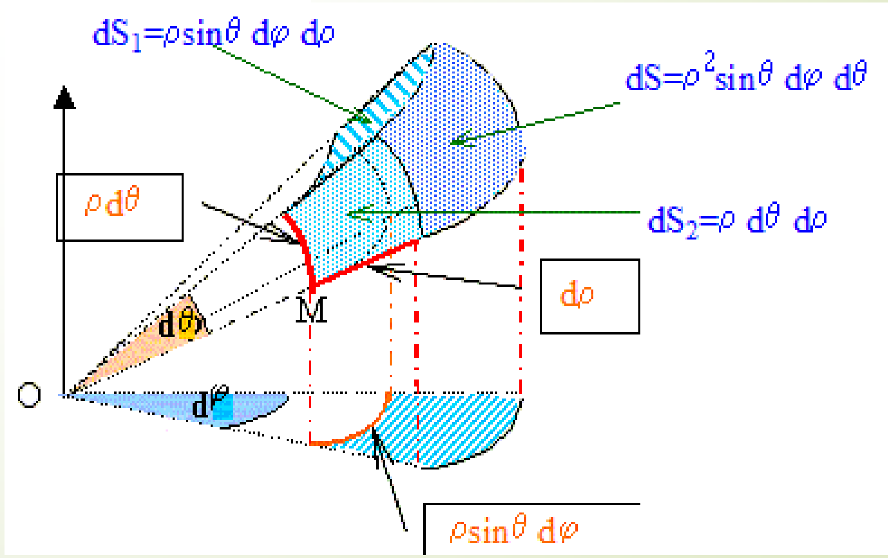
j	m	val. prop. de $\hat{J}^2$	val. prop. de $\hat{J}_z$
0	0	0	0
1/2	1/2 -1/2	$3\hbar^2/4$	$\hbar/2$ $-\hbar/2$
1	1 0 -1	$2\hbar^2$	$\hbar$ 0 $-\hbar$

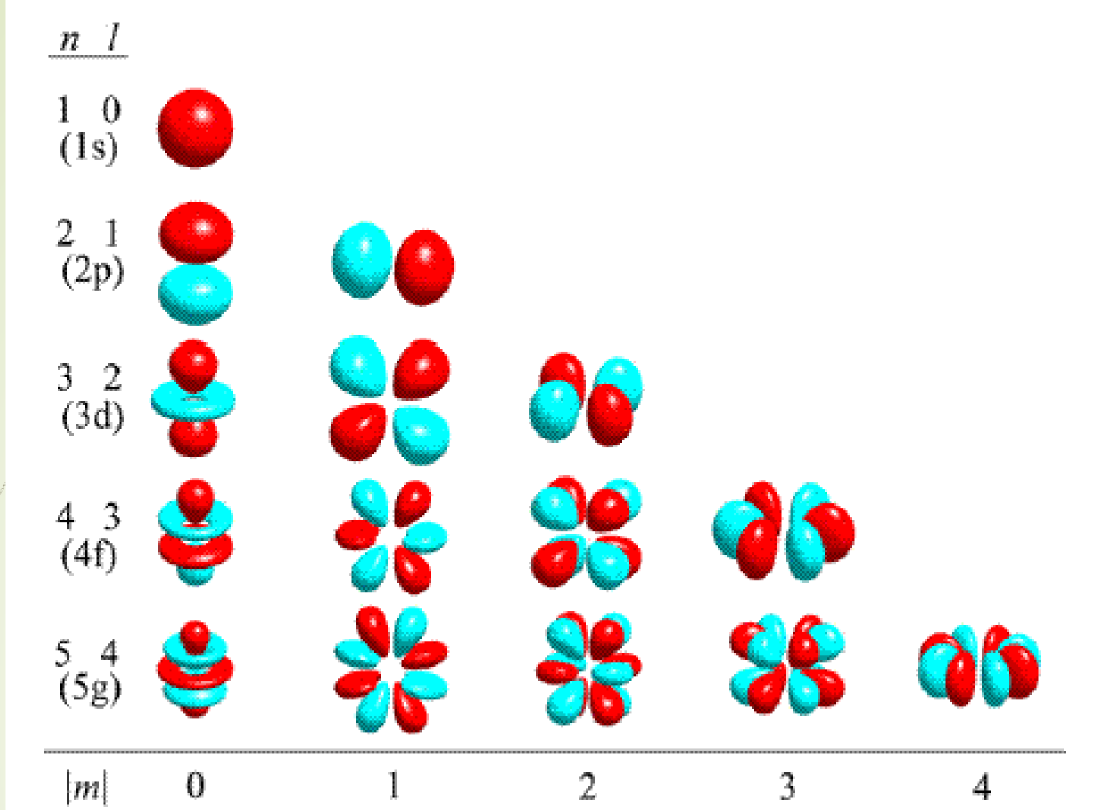

z
m =2 ħ
1 ħ
0
-1ħ
-2 ħ
J
J-
J+


J_z
J
y
J
x



$$0 \le \theta \le \pi$$
$$0 \le \varphi \le 2\pi$$





$$Y_0^0 = \frac{1}{2\sqrt{\pi}}$$

$$Y_1^1 = \frac{\sqrt{3}}{2\sqrt{\pi}} \sin\phi \sin\theta$$

$$Y_1^0 = \frac{\sqrt{3}}{2\sqrt{\pi}} \cos\theta$$

$$Y_1^{-1} = \frac{\sqrt{3}}{2\sqrt{\pi}} \cos\phi \sin\theta$$

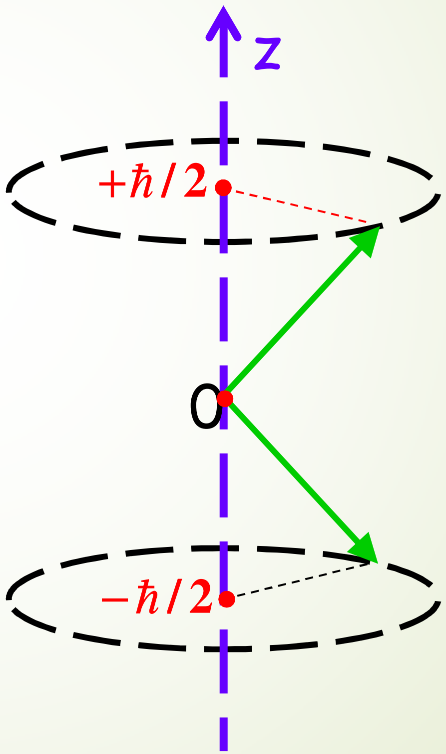
$$Y_2^{-2} = \frac{\sqrt{15}}{2\sqrt{\pi}} \cos\phi \sin\phi \sin^2\theta$$

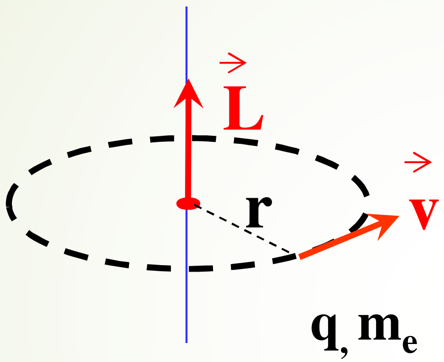
$$Y_2^{-1} = \frac{\sqrt{15}}{2\sqrt{\pi}} \sin\phi \cos\theta \sin\theta$$

$$Y_2^0 = \frac{\sqrt{5}}{4\sqrt{\pi}} (3\cos^2\theta - 1)$$

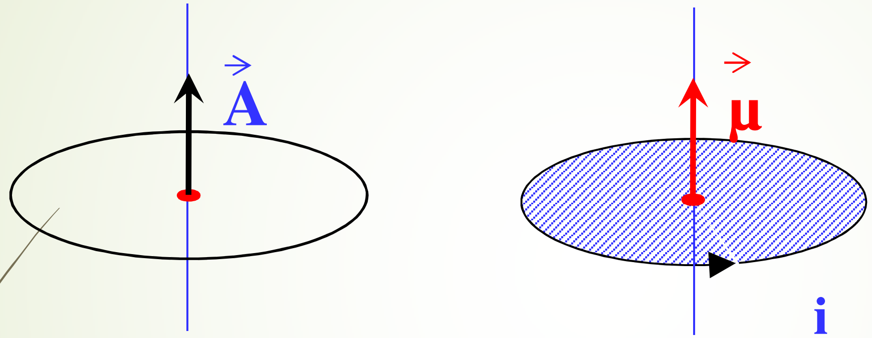
$$Y_2^1 = \frac{\sqrt{15}}{2\sqrt{\pi}} \cos\phi \cos\theta \sin\theta$$

$$Y_2^2 = \frac{\sqrt{15}}{4\sqrt{\pi}} (\cos^2\phi - \sin^2\phi) \sin^2\theta$$


z
+ħ/2
0
−ħ/2

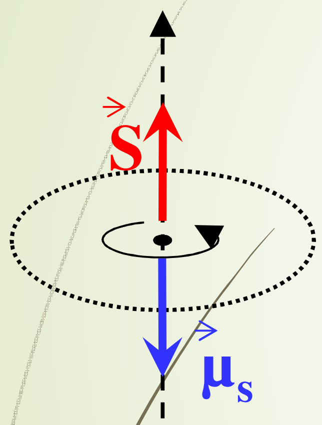


L
r
v
q, me



$$\vec{\mu} = i\,\vec{A}$$

Cas de l’électron



Cas du proton