Fonctions angulaires

$$Y_0^0 = (\frac{1}{4\pi})^{1/2}$$

$$Y_1^0 = (\frac{3}{4\pi})^{1/2} cos(\theta)$$

$$Y_1^{\pm 1} = \mp(\frac{3}{8\pi}) sin(\theta) e^{\pm i\phi}$$

$$Y_2^0 = (\frac{5}{16\pi})^{1/2}(3cos^2(\theta) - 1)$$

$$Y_2^{\pm 1} = \mp(\frac{15}{8\pi})^{1/2} sin(\theta) cos(\theta) e^{\pm i\phi}$$

$$Y_2^{\pm 2} = (\frac{15}{32\pi})^{1/2} sin^2(\theta) e^{\pm 2i\phi}$$

$$Y_3^0 = (\frac{7}{16\pi})^{1/2}(5cos^3(\theta) - 3cos(\theta))$$

$$Y_3^{\pm 1} = \mp(\frac{21}{64\pi})^{1/2} sin(\theta)(5\cos^2(\theta) - 1) e^{\pm i\phi}$$

$$Y_3^{\pm 2} = (\frac{105}{32\pi})^{1/2} sin^2(\theta) cos(\theta) e^{\pm 2i\phi}$$

$$Y_3^{\pm 3} = \mp(\frac{35}{64\pi})^{1/2} sin^3(\theta) e^{\pm 3i\phi}$$

Fonctions radiales

$$R_{10} = 2a^{-3/2} e^{-r/a}$$

$$R_{20} = \frac{1}{\sqrt{2}} a^{-3/2}(1 - \frac{1}{2}\frac{r}{a}) e^{-r/2a}$$

$$R_{21} = \frac{1}{\sqrt{24}} a^{-3/2} \frac{r}{a} e^{-r/2a}$$

$$R_{30} = \frac{2}{\sqrt{27}} a^{-3/2}(1 - \frac{2}{3}\frac{r}{a} + \frac{2}{27}(\frac{r}{a})^2) e^{-r/3a}$$

$$R_{31} = \frac{8}{27\sqrt{6}} a^{-3/2}(1 - \frac{1}{6}\frac{r}{a})(\frac{r}{a}) e^{-r/3a}$$

$$R_{32} = \frac{4}{81\sqrt{30}} a^{-3/2}(\frac{r}{a})^2 e^{-r/3a}$$

$$R_{40} = \frac{1}{4} a^{-3/2}(1 - \frac{3}{4}\frac{r}{a} + \frac{1}{8}(\frac{r}{a})^2 - \frac{1}{192}(\frac{r}{a})^3) e^{-r/4a}$$

$$R_{41} = \frac{\sqrt{5}}{16\sqrt{3}} a^{-3/2}(1 - \frac{1}{4}\frac{r}{a} + \frac{1}{80}(\frac{r}{a})^2)\frac{r}{a} e^{-r/4a}$$

$$R_{42} = \frac{1}{64\sqrt{5}} a^{-3/2}(1 - \frac{1}{12}\frac{r}{a})(\frac{r}{a})^2 e^{-r/4a}$$

$$R_{43} = \frac{1}{768\sqrt{35}} a^{-3/2}(\frac{r}{a})^3 e^{-r/4a}$$

Matrices de Pauli

$$\sigma_x = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix} \sigma_y = \begin{pmatrix} 0 & -i \\ i & 0 \end{pmatrix} \sigma_z = \begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$$