Coordonnés sphérique

(r,θ,ϕ)

Les équations	$\begin{cases} x = r\sin\theta\cos\phi \\ y = r\sin\theta\sin\phi \\ z = r\cos\theta \end{cases}$
Les limites	$0 \le r$ $0 \le \theta \le \pi$ $0 \le \phi < 2\pi$
Facteurs d'échelle	$h_1 = 1$ $h_2 = r$ $h_3 = r\sin\theta$
Élément de déplacement	$d\vec{l} = dr\hat{r} + rd\theta\hat{\theta} + r\sin\theta d\phi\hat{\phi}$
Élément de surface	$ds_r = r^2\sin\theta d\theta d\phi$ $ds_\theta = r\sin\theta dr d\phi$ $ds_\phi = r dr d\theta$
Élément de volume	$dV = r^2\sin\theta dr d\theta d\phi$
Gradient	$\vec{\nabla} f = \frac{\partial f}{\partial r}\hat{r} + \frac{1}{r}\frac{\partial f}{\partial\theta}\hat{\theta} + \frac{1}{r\sin\theta}\frac{\partial f}{\partial\phi}\hat{\phi}$
Divergence	$\vec{\nabla}.\vec{A} = \frac{1}{r^2\sin\theta}\left[\frac{\partial}{\partial r}(r^2\sin\theta A_r) + \frac{\partial}{\partial\theta}(r\sin\theta A_\theta) + \frac{\partial}{\partial\phi}(rA_\phi)\right]$
Rotationnel	$\vec{\nabla}\times\vec{A} = \frac{1}{r^2\sin\theta}\begin{vmatrix} \hat{r} & r\hat{\theta} & r\sin\theta\hat{\phi} \\ \frac{\partial}{\partial r} & \frac{\partial}{\partial\theta} & \frac{\partial}{\partial\phi} \\ A_r & rA_\theta & r\sin\theta A_\phi \end{vmatrix}$
Laplacien	$\nabla^2\Phi = \frac{1}{r^2}\frac{\partial}{\partial r}\left(r^2\frac{\partial\Phi}{\partial r}\right) + \frac{1}{r^2\sin\theta}\frac{\partial}{\partial\theta}\left(\sin\theta\frac{\partial\Phi}{\partial\theta}\right) + \frac{1}{r^2\sin^2\theta}\frac{\partial^2\Phi}{\partial\phi^2}$
Vecteur position	$\vec{r} = r\,\hat{r}$ ou bien $\vec{r} = r\,\hat{r}(\theta,\phi)$
Vecteur position unitaire	$\hat{r} = \hat{r}$ ou bien $\hat{r} = \hat{r}(\theta,\phi)$