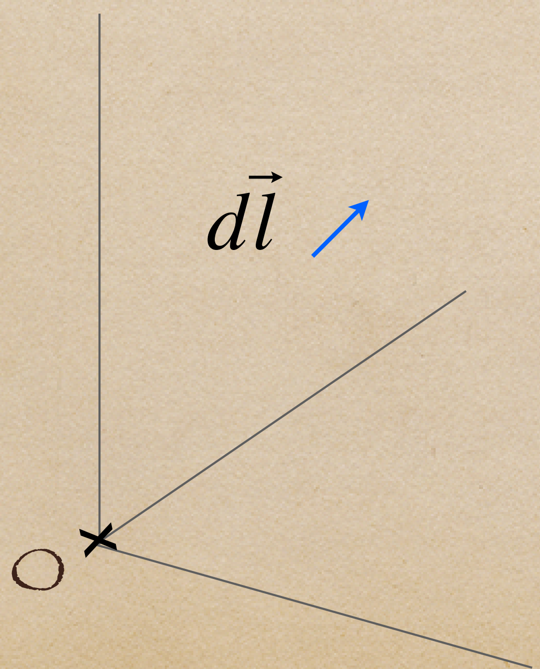
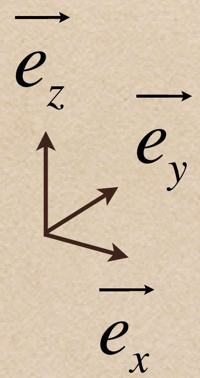
γ - Déplacements élémentaires

Soit $d\vec{l}$ un vecteur de déplacement infinitésimal :

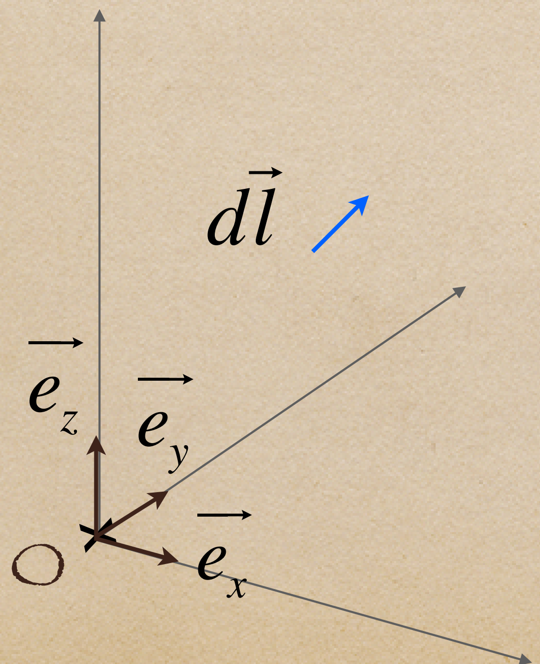


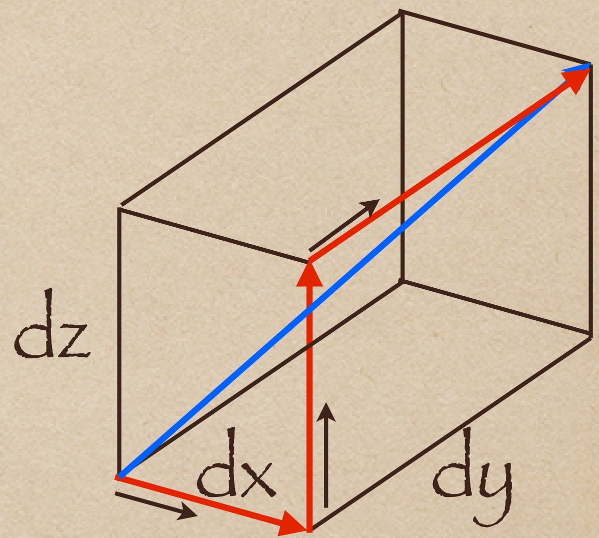
ZOOM :

En cartésienne :



ZOOM :

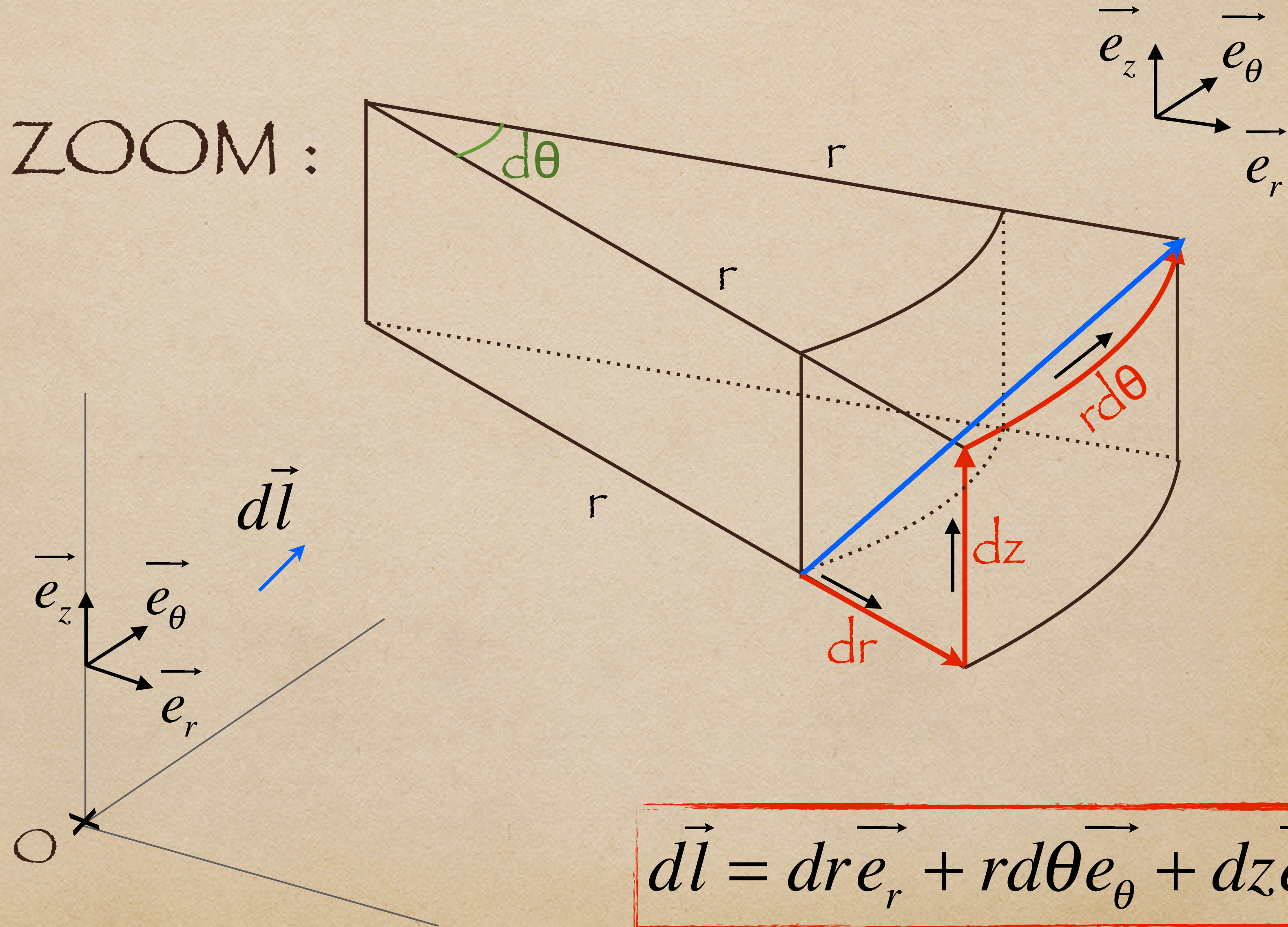




$$d\vec{l} = dx\,\vec{e_x} + dy\,\vec{e_y} + dz\,\vec{e_z}$$

En cylindrique :

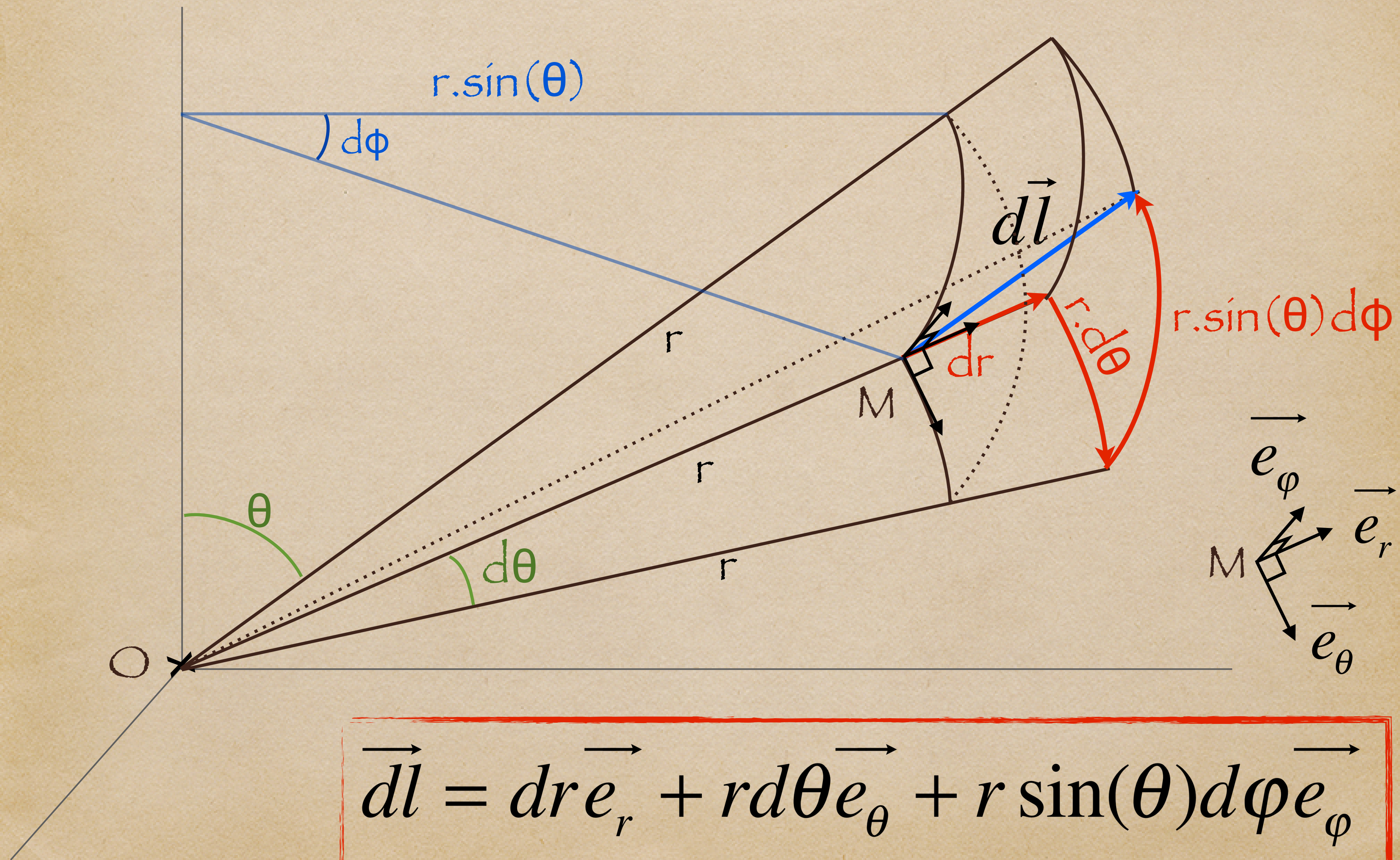
ZOOM :



$$\vec{dl} = dr\vec{e_r} + rd\theta\vec{e_\theta} + dz\vec{e_z}$$

En sphérique :

ZOOM :



$$\overrightarrow{dl} = dr\overrightarrow{e_r} + rd\theta\overrightarrow{e_\theta} + r\sin(\theta)d\varphi\overrightarrow{e_\varphi}$$

Interprétation géométrique de la vitesse

$$\vec{V} = \frac{d\vec{l}}{dt}$$

Cartésienne

$$d\vec{l} = dx\overrightarrow{e_x} + dy\overrightarrow{e_y} + dz\overrightarrow{e_z}$$

$$\vec{V} = \frac{dx}{dt}\overrightarrow{e_x} + \frac{dy}{dt}\overrightarrow{e_y} + \frac{dz}{dt}\overrightarrow{e_z}$$

$$\vec{V} \equiv \left.\frac{d\overrightarrow{OM}}{dt}\right|_{R_0} = \left| \begin{array}{l} \dot{x}(t) \\ \dot{y}(t) \\ \dot{z}(t) \end{array} \right.$$

cylindrique

$$d\vec{l} = dr\overrightarrow{e_r} + rd\theta\overrightarrow{e_\theta} + dz\overrightarrow{e_z}$$

$$\vec{V} = \frac{dr}{dt}\overrightarrow{e_r} + r\frac{d\theta}{dt}\overrightarrow{e_\theta} + \frac{dz}{dt}\overrightarrow{e_z}$$

$$\vec{V} = \left.\frac{d\overrightarrow{OM}}{dt}\right|_{R_0} = \left| \begin{array}{l} \dot{r}(t) \\ r\dot{\theta}(t) \\ \dot{z}(t) \end{array} \right.$$