Fluïdummechanica

Hydrostatica

Brecht Baeten[1]

[1]KU Leuven, Technologie campus Diepenbeek, e-mail:
brecht.baeten@kuleuven.be

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Inhoud

Voorbeeld

Bron: http://www.nasa.gov/

Inhoud

Mechanica

Mechanica

Behoud van massa

$$\frac{\mathrm{d}m}{\mathrm{d}t} = 0 \tag{1}$$

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Behoud van impuls

$$\frac{\mathrm{d}\mathbf{P}}{\mathrm{d}t} = \mathbf{F} \tag{2}$$

Mechanica

Behoud van massa

$$\frac{\mathrm{d}m}{\mathrm{d}t} = 0 \tag{1}$$

Behoud van impuls

$$\frac{\mathrm{d}\mathbf{P}}{\mathrm{d}t} = \mathbf{F} \tag{2}$$

Behoud van energie

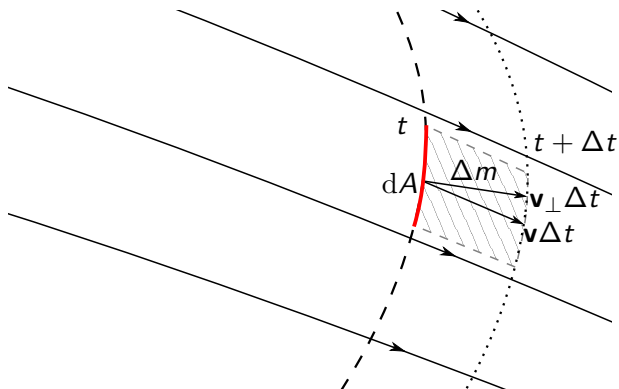$$\frac{\mathrm{d}E}{\mathrm{d}t} = \dot{Q} - \dot{W} \tag{3}$$

Inhoud
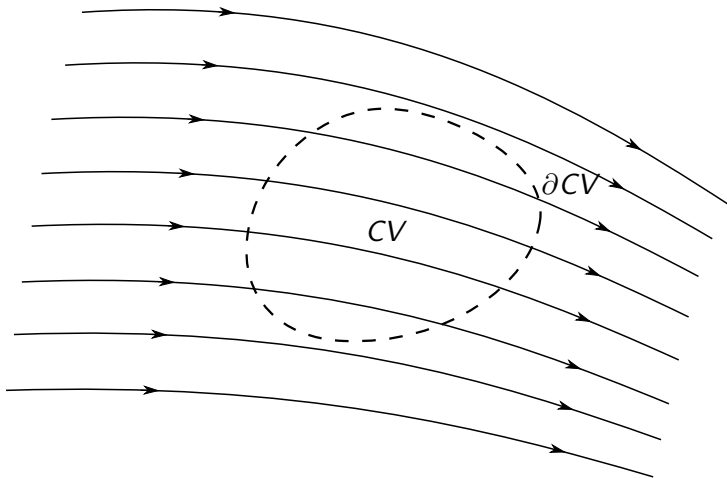
Controlevolume

Behoud van massa

$$\left[\begin{array}{c} \text{De verandering} \\ \text{van massa in} \\ \text{het controlevolume} \end{array}\right] + \left[\begin{array}{c} \text{De netto} \\ \text{massastroom uit} \\ \text{het controlevolume} \end{array}\right] = 0 \qquad (4)$$

Massastroom

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$$\Delta m = \rho \Delta x_\perp \mathrm{d}A \qquad (5)$$

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$$\mathrm{d}\dot{m} = \rho v_\perp \mathrm{d}A \tag{8}$$

Behoud van impuls

$$\left[\begin{array}{c} \text{De verandering} \\ \text{van impuls} \\ \text{in het} \\ \text{controlevolume} \end{array}\right] + \left[\begin{array}{c} \text{De netto} \\ \text{impulsstroom} \\ \text{uit het} \\ \text{controlevolume} \end{array}\right] = \left[\begin{array}{c} \text{De totale} \\ \text{kracht} \\ \text{op het} \\ \text{controlevolume} \end{array}\right] \tag{9}$$

Behoud van energie

$$
\begin{bmatrix}
\text{De verandering} \\
\text{van energie} \\
\text{in het} \\
\text{controlevolume}
\end{bmatrix}
+
\begin{bmatrix}
\text{De netto} \\
\text{energiestroom} \\
\text{uit het} \\
\text{controlevolume}
\end{bmatrix}
=
\begin{bmatrix}
\text{De warmtesroom} \\
\text{toegevoegd en} \\
\text{arbeidsstroom} \\
\text{onttrokken aan} \\
\text{het controlevolume}
\end{bmatrix}
$$

$$(10)$$