

Solution 5.2

Étant donné que pour un canal rectangulaire, l'éq. (5.2a) donne :

$$\frac{y_2}{y_1} = \frac{1}{2} \left[\sqrt{1 + 8\text{Fr}_1^2} - 1 \right] = \frac{1}{2} \left[\sqrt{1 + 8 \times 6^2} - 1 \right]$$

$$\frac{y_2}{y_1} = 8 \quad (\text{S5.2})$$

De l'éq. (5.4) :

$$\Delta H_s = \frac{(y_2 - y_1)^3}{4y_1y_2} = \frac{y_1^3 \left(\frac{y_2}{y_1} - 1 \right)^3}{4y_1^2 \frac{y_2}{y_1}} \Rightarrow \frac{\Delta H_s}{y_1} = \frac{\left(\frac{y_2}{y_1} - 1 \right)^3}{4 \frac{y_2}{y_1}} = \frac{(8 - 1)^3}{4 \times 8} = 10,719$$

$$\Rightarrow y_1 = \frac{\Delta H_s}{10,719} = \frac{3}{10,719}, \quad \boxed{y_1 = 0,28 \text{ m}}.$$

$$(\text{S5.2}) \Rightarrow \frac{y_2}{y_1} = 8 \Rightarrow y_2 = 8y_1 = 8 \times 0,28, \quad \boxed{y_2 = 2,24 \text{ m}}. \quad \blacksquare$$