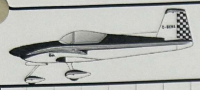
NOM: _____ GROUPE: _____ DATE: _____

NUMÉRO DU COURS: _____ PROFESSEUR: _____

SUJET: _____ ÉQUIPE: _____ AVION: _____ PAGE: ____ DE ____



TECHNIQUES DE GÉNIE AÉROSPATIAL

ÉNA ÉCOLE NATIONALE D'AÉROTECHNIQUE

$$\frac{S}{Deff} = \frac{1}{r}\frac{\partial c}{\partial r} + \frac{\partial^2 c}{\partial r^2} + \underbrace{\frac{1}{r}\left(\frac{\Delta r}{2}\frac{\partial^2 c}{\partial r^2} \dots\right) + \left(\frac{\Delta r^2}{12}\frac{\partial^4 c}{\partial r^4} \dots\right)}_{\text{erreur de troncature.}}$$

$\Rightarrow$ schéma consistant.
schéma ordre 1 (Δr exposant 1).

on reprend le même calcul par l'ordre 2

$$\frac{S}{Deff} = \frac{1}{r}\left(\frac{C_{i+1} - C_{i-1}}{2\Delta r}\right) + \frac{C_{i+1} - 2C_i + C_{i-1}}{\Delta r^2}.$$

$$\frac{S}{Deff} = \frac{1}{r 2\Delta r}\left(C_i + \Delta r\frac{\partial c}{\partial r} + \frac{\Delta r^2}{2}\frac{\partial^2 c}{\partial r^2} - \left(C_i - \Delta r\frac{\partial c}{\partial r} + \frac{\Delta r^2}{2}\frac{\partial^2 c}{\partial r^2} \dots\right)\right)$$

$$+ \frac{1}{\Delta r^2}\left(C_i + \Delta r\frac{\partial c}{\partial r} + \frac{\Delta r^2}{2}\frac{\partial^2 c}{\partial r^2} - 2C_i + C_i - \Delta r\frac{\partial c}{\partial r} + \frac{\Delta r^2}{2}\frac{\partial^2 c}{\partial r^2}\right)$$

$$\frac{S}{Deff} = \left(\frac{1}{r}\right)\left(\frac{1}{2\Delta r}\right)\left(2\Delta r\frac{\partial c}{\partial r} + \frac{\Delta r^3}{3}\frac{\partial^3 c}{\partial r^3} \dots\right)$$

$$+ \frac{1}{\Delta r^2}\left(\Delta r^2\frac{\partial^2 c}{\partial r^2} + \frac{\Delta r^4}{12}\frac{\partial^4 c}{\partial r^4} \dots\right)$$

$$\frac{S}{Deff} = \left(\frac{1}{r}\right)\left(\frac{\partial c}{\partial r} + \frac{\Delta r^2}{6}\frac{\partial^3 c}{\partial r^3} \dots\right)$$

$$+ \left(\frac{\partial^2 c}{\partial r^2}\right) + \left(\frac{\Delta r^2}{12}\frac{\partial^4 c}{\partial r^4} \dots\right)$$

$$\frac{S}{Deff} = \frac{1}{r}\frac{\partial c}{\partial r} + \frac{\partial^2 c}{\partial r^2} + \left[\frac{\Delta r^2}{6}\frac{\partial^3 c}{\partial r^3} + \frac{\Delta r^2}{12}\frac{\partial^4 c}{\partial r^4} \dots\right]$$

→ troncature
- ordre 2
- constant