Transition vers la turbulence en conduite cylindrique pour un fluide non Newtonien.

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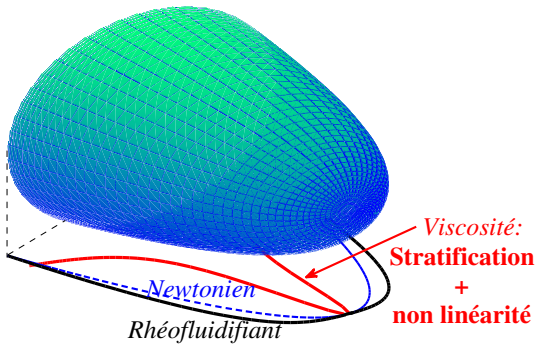
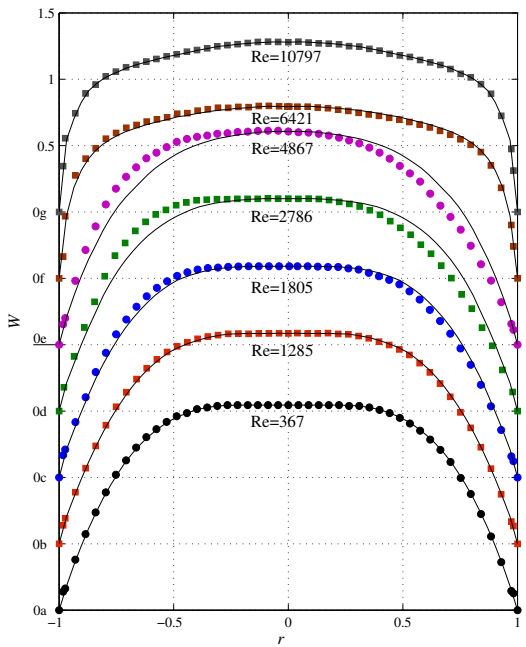




- Retard à la transition.
- Assymétrie.

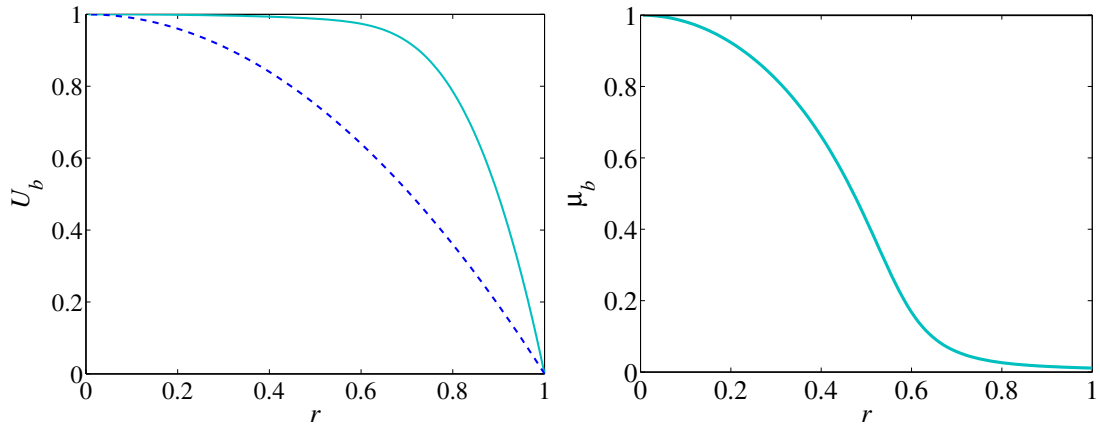
Équations gouvernant le problème:

$$\nabla \cdot \boldsymbol{U} = 0$$

$$\partial_t \boldsymbol{U} + (\boldsymbol{U} \cdot \boldsymbol{\nabla})\, \boldsymbol{U} = -\boldsymbol{\nabla} P + \boldsymbol{\nabla} \cdot \boldsymbol{\tau}$$

$$\boldsymbol{\tau} = \frac{1}{Re} \mu \dot{\boldsymbol{\gamma}}$$

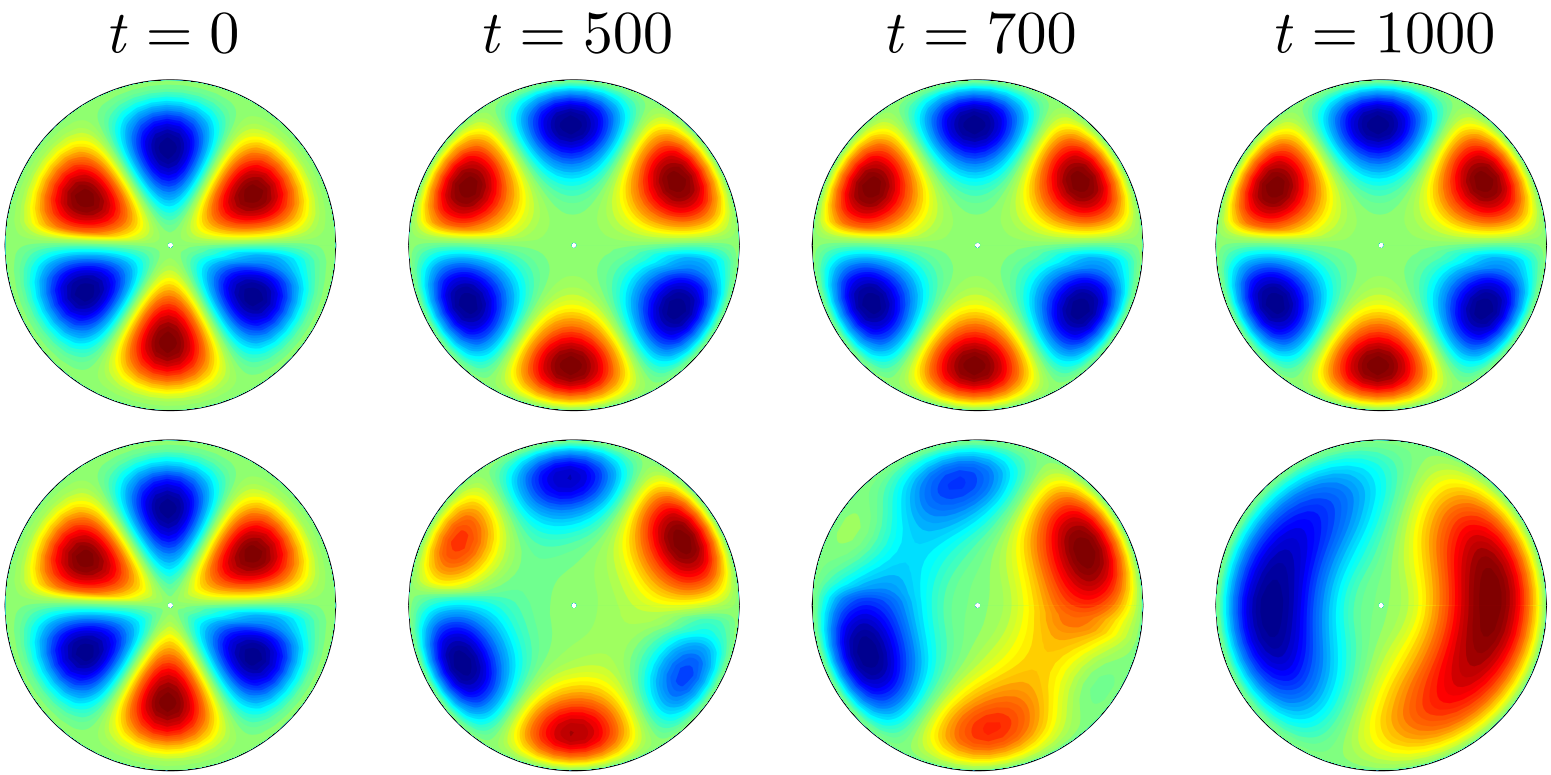
$$\mu = \mu_\infty + (1 - \mu_\infty) \left[1 + (\lambda \dot{\gamma})^2\right]^{(n_p - 1)/2}$$



Méthode pseudo-spectral Fourier-Chebyshev[a]
Chemin temporel: AB_4BD_4.

[a] A.Meseguer, F. Mellibovsky: On a solenoidal Fourier-Chevishev spectral method for stability analysis of the Hagen-Poiseuille flow. *Applied Numerical Mathematics*, 57 (2007) 920-938.

Résultats numériques



Condition initiale: 3 paires de rouleaux longitudinaux (n=3; l=0).(Haut) Cas purement stratifié. (Bas) Influence de la non linearité de μ