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Contribution ID: 3781 Type: Oral Competition (Graduate Student) / Compétition orale (Étudiant(e) du 2e ou 3e cycle)

(G*) Investigating the Flow Transition to Turbulence Using Simple Spin-Echo Magnetic Resonance Techniques

Wednesday 21 June 2023 10:45 (15 minutes)

Our lab recently introduced a methodology to determine the average velocity and flow behaviour index of laminar pipe flow using simple magnetic resonance techniques. The knowledge of these two parameters provides the information needed to reconstruct the flow velocity profile. However, as the flow velocity increases, the flow will begin to develop turbulence. For a given fluid moving through a pipe, the flow velocity profile is flatter in the centre of the pipe at turbulent flow rates compared to laminar flow. An effective flow behaviour index may also be used to approximately model the time-averaged velocity profile as a function of Reynolds number as a Newtonian fluid transitions to turbulence. In this presentation I will show the results of testing the utility of such a simplification in monitoring that transition.

Keyword-1

Magnetic resonance

Keyword-2

Transition to turbulence

Keyword-3

Flow measurement

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