Contribution ID: **1026** Type: **Oral (Student, In Competition) / Orale (Étudiant(e), inscrit à la compétition)**

Vibrating-Wire Rheology

Monday 13 June 2016 11:30 (15 minutes)

We are investigating the use of a vibrating wire device to measure the viscoelastic moduli of non-Newtonian fluids. Our device consists of a tungsten wire under tension and immersed in a fluid. When a magnetic field is applied and an alternating current is passed through the wire, it vibrates at the driving frequency. The resonance frequency of the wire can be tuned by varying its length and the applied tension. We measure the voltage induced across the wire as a function of frequency. An analytic expression can be derived relating the voltage across the wire to viscosity. For non-Newtonian fluids we modify the Newtonian expression to include a complex viscosity, allowing the viscoelastic moduli to be determined from the measured voltage. We discuss the design and operation of our vibrating wire rheometer and demonstrate its ability to accurately measure the properties of Newtonian and non-Newtonian fluids.

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