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UNSTEADY LAMINAR FLOW IN A TUBE

by

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SUMMARY

The unsteady laminar flow through a tube of an incompressible fluid does not appear to have been adequately described in the literature. This paper presents the theoretical solution for the case of the pressure gradient varying exponentially with time. The time variation of the viscous resistance, as a fraction of that for Poiseville flow with the same flow rate, is presented for various rates of change of pressure gradient.

This work was stimulated by discrepancies between theoretical predictions and experimental results for the response of an overdamped liquid manometer to a sudden change in applied pressure difference, reported to the Third Australasian Conference. The contribution of the work presented here to explaining these discrepancies is described.

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