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The importance of flow history in mixed shear and extensional flows

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## Highlights

- We quantify mixed shear and elongational flows fully with two parameters
- We obtain an analytic result for Oldroyd B fluid stresses in planar mixed flows
- We extend this analysis to periodically varying mixed planar flows
- We analyze flows of dilute polymer solutions past cylindrical bubbles
- We demonstrate the importance of flow history in fluid stress analysis

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