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Nonlinear vibration analysis of a fractional dynamic model for the viscoelastic pipe conveying fluid

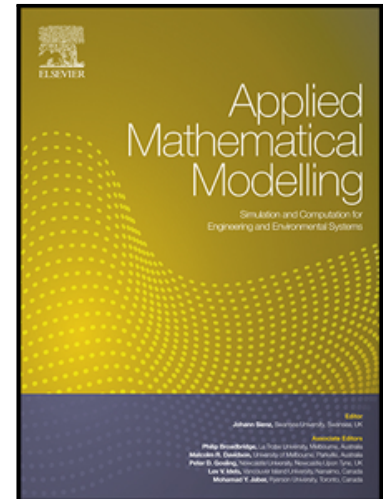
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Highlights

- A new non-linear, fractional dynamic model of the viscoelastic pipe is established.
- Analytical solutions of the fractional model are derived using the method of multiple scales.
- The amplitude predicted by the fractional model is much larger than that predicted by the previous model.
- With the fractional order increases, the nonlinear frequency increases at first and then diminishes.
- The fractional order can change the variation trend of the amplitude versus the fluid velocity.

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