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**Predicting the onset of high-frequency self-excited oscillations in a channel with an elastic wall** THOMAS WARD, ROBERT WHITTAKER, University of East Anglia — Flow-induced oscillations of fluid-conveying elastic-walled channels arise in many industrial and biological systems including the oscillation of the vocal cords during phonation. We derive a system of equations that describes the wall displacement in response to the steady and oscillatory components of the fluid pressure derived by Whittaker et. al. (2010). We show that the steady pressure component results in a base state deformation assumed to be small in magnitude relative to the length of the channel. The oscillation frequency of the elastic wall is determined by an eigenvalue problem paramterised by the shape of the base state deformation, the strength of axial tension relative to azimuthal bending, $\mathcal{F}$, and the size of non-linear stretching effects from the wall's initial deformation, $\mathcal{K}$. We determine the slow growth or decay of the normal modes in each by considering the energy budget of the system. The amplitude of the oscillations grow or decay exponentially with a growth rate $\Lambda$, which may be expressed in terms of a critical Reynolds number $Re_c$. We use numerical simulations to identify three distinct regions in parameter regimes space and determine the stability of oscillations in each.

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