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Linear stability analysis of capillary instabilities for concentric cylindrical shells[1] XIANGDONG LIANG, DAOSHENG DENG, Massachusetts Institute of Technology, JEAN-CHRISTOPHE NAVE, McGill University, STEVEN G. JOHNSON, Massachusetts Institute of Technology — We present a linear stability analysis of capillary instabilities in concentric cylindrical flows of N fluids with arbitrary viscosities, thicknesses, and surface tensions. This generalizes previous work by Tomotika ($N = 2$) and Stone & Brenner ($N = 3$, equal viscosities). We briefly explain the derivation, consider interesting limiting cases for $N = 3$ and $N \to \infty$, and predict a phenomenon of competing breakup lengthscales in a 3-fluid system that we demonstrate with full 3d calculations.

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