

Steep nonlinear global modes in spatially developing media

BENOÎT PIER, PATRICK HUERRE, JEAN-MARC CHOMAZ, & ARNAUD COUAIRON

LadHyX, École polytechnique - CNRS, 91128 Palaiseau Cedex, France

Phys. Fluids. **10** (1998), 2433-2435.

Abstract:

A new frequency selection criterion valid in the fully nonlinear regime is presented for extended oscillating states in spatially developing media. The spatial structure and frequency of these modes are dominated by the existence of a sharp front connecting linear to nonlinear regions. A new type of fully nonlinear time harmonic solutions called *steep global modes* is identified in the context of the supercritical complex Ginzburg-Landau equation with slowly varying coefficients. A similar formulation is likely to be applicable to fully nonlinear synchronized global oscillations in spatially developing free shear flows.