Wave trains bifurcating from Poiseuille flow in viscous compressible fluid

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Abstract

Plane Poiseuille flow in viscous compressible fluid is known to be asymptotically stable if Reynolds number and Mach number are sufficiently small. On the other hand, for Reynolds and Mach numbers being not necessarily small, an instability criterion for plane Poiseuille flow is known; and the criterion says that, when Reynolds number increases, a pair of complex conjugate eigenvalues of the linearized operator cross the imaginary axis. We will show that a spatially periodic traveling wave bifurcates from plane Poiseuille flow when the critical eigenvalues cross the imaginary axis. This talk is based on a joint work with Professor Takaaki Nishida (Kyoto University).