1108-35-557 **Alin Pogan*** (pogana@miamioh.edu), Miami university, Department of Mathematics, Oxford, OH 45056. *O(2) Hopf bifurcation of viscous shock waves in a channel.*

We study $O(2)$ transverse Hopf bifurcation, or "cellular instability", of viscous shock waves in an infinite channel, with periodic boundary conditions, for a class of hyperbolic-parabolic systems including the equations of thermoviscoelasticity. Due to the refection symmetry property of our model, the underlying bifurcation is not of planar Hopf type, but, rather, a four-dimensional $O(2)$ Hopf bifurcation: roughly speaking, a "doubled" Hopf bifurcation coupled by nonlinear terms. Since the linearized operator about the wave has no spectral gap, the standard center manifold theorems do not apply; indeed, existence of a center manifold is unclear. To prove the result, we use the Lyapunov–Schmidt reduction method applied to the time-T evolution map of the underlying perturbation equations, resulting in a 4-dimensional stationary bifurcation problem with $O(2)$ symmetry plus an additional "approximate S^1 symmetry" induced by the underlying rotational linearized flow. (Received January 20, 2015)