

1164-39-155

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I will present a computational approach to Hopf bifurcation verification for functional differential equations. The verification of a steady state, imaginary eigenvalues and their transversality amounts to a finite-dimensional problem which we rigorously solve using a Newton-Kantorovich-type theorem. To prove the imaginary eigenvalues are simple and that there is no resonance, we use some *empha priori* estimates and rigorous contour integration on the characteristic equation to count all eigenvalues in a neighbourhood of the imaginary axis. An alternative approach based on validated computation of the eigenvalues of the step map is available for systems with only a discrete constant delay. We test the method on a few benchmark problems, before proving some results on periodic traveling waves in the Fisher equation with a nonlocal reaction term. (Received January 17, 2021)