Stability and Hopf Bifurcation in Differential Equations with One Delay

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Abstract: A class of parameter dependent differential equations with one delay is considered. A decomposition of the parameter space into domains where the corresponding characteristic equation has a constant number of zeros with positive real part is provided. The local stability analysis of the zero solution and the computation of all Hopf bifurcation points with respect to the delay is given.

Keywords: *Nonlinear delay differential equations; zeros of quasi-polynomials; local stability; Hopf bifurcation*

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