AN APPROACH FOR DETERMINING HOPF BIFURCATION POINTS OF MULTIPLE DELAYED LINEAR DIFFERENTIAL SYSTEMS

Franck Davhys Reval Langa, Mohamed Taki Abdoul Karim, Mahamat Saleh Daoussa Haggar and Benjamin Mampassi

Abstract

The Hopf bifurcation is known to be important for the stability study of parametric dynamical systems, in the sense that it provides oscillators solutions which are the transition from stability to instability regions. For differential equations with multiple delays considered as parameters, it is difficult to determine bifurcation values. Here, we present a general algorithm for computing Hopf bifurcation solutions suitable for multiple delays differential systems. The proposed algorithm is based on an approach that consists in using dense curves of $\mathbb{R}^n$ to bring the original problem to a simple one-dimensional problem. Some examples, illustrating the use of the method, are included.