COMPUTATION OF HOPF BRANCHES BIFURCATING FROM A HOPF/PITCHFORK POINT FOR PROBLEMS WITH Z_2-SYMMETRY

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摘要
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Abstract This paper is concerned with the computation of Hopf branches emanating from a Hopf/Pitchfork point in a two-parameter nonlinear problem satisfying a Z_2-symmetry condition. Our aim is to present a new approach to the theoretical and computational analysis of the bifurcating Hopf branches at this singular point by using the system designed to calculate Hopf points and exploring its symmetry. It is shown that a Hopf/Pitchfork point is a pitchfork bifurcation point in the system. Hence standard continuation and branch-switching can be used to compute these Hopf branches. In addition, an effect method based on the extended system of the singular points is developed for the computation of branch of secondary (non-symmetric) Hopf points. The implementation of Newton's method for solving the extended system is also discussed. A numerical example is given.

Key words   Hopf/pitchfork point Z_2-symmetry   Hopf point   bifurcation   Extended system

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