

论文与报告

速度时滞反馈控制下磁浮系统的稳定性与Hopf分岔

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摘要

The problem of time delay speed feedback in the control loop is considered here. Its effects on the linear stability and dynamic behavior of the maglev system are investigated. It is found that a Hopf bifurcation can take place when the time delay exceeds certain values. The stability condition of the maglev system with the time delay is acquired. The direction and stability of the Hopf bifurcation are determined by constructing a center manifold and by applying the normal form method. Finally, numerical simulations are performed to verify the analytical result.

关键词 [Maglev system](#) [delayed speed feedback control](#) [stability](#) [Hopf bifurcation](#) [center manifold](#) [normal form](#)

分类号

Stability and Hopf Bifurcation of the Maglev System with Delayed Speed Feedback Control

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Abstract

The problem of time delay speed feedback in the control loop is considered here. Its effects on the linear stability and dynamic behavior of the maglev system are investigated. It is found that a Hopf bifurcation can take place when the time delay exceeds certain values. The stability condition of the maglev system with the time delay is acquired. The direction and stability of the Hopf bifurcation are determined by constructing a center manifold and by applying the normal form method. Finally, numerical simulations are performed to verify the analytical result.

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