

## **Research on active vibration isolation based on chaos synchronization**

**S.J. Zhu;Q.H Zeng;J.J Lou and Q.W He**

### **Summary**

Line spectra are the most visible signs of the ships' radiated noise spectrum. The potential of chaotifying vibration isolation systems to reduce line spectra and improve its capability of concealment have been recently reported. Basically, as the existing isolation system design is based on linear theory, it is difficult to produce the nonlinear chaotic motion; and if the vibration isolation system(VIS) is designed directly using the nonlinear theory, it is also difficult to produce the chaotic motion because of the difficulties in accurate calculation of vibration isolation device parameters. In this paper, a controller design method is put forward using the Lyapunov stability theory to synchronize the outputs of a linear system with persistent disturbances with those of a chaotic system. The controller design method is applied in a double layer linear vibration isolation to produce a persistent and steady chaotic motion by tracking the outputs of a chaotic Duffing system, the force transferred to base is effectively reduced, and thus the isolation performance is improved.

