

Robinson, James C.**Inertial manifolds and the cone condition.** (English) Zbl 0787.34036
Dyn. Syst. Appl. 2, No. 3, 311-330 (1993).

Summary: The “cone condition”, used in passing in many proofs of the existence of inertial manifolds, is examined in more detail. Invariant manifolds for dissipative flows can be obtained directly using no other dynamical information. After finding a condition for the exponential attraction of trajectories to such a manifold, a cone invariance property is used to show the existence of orbits on the manifold which track a given orbit of the flow. This leads to a concise proof which guarantees the existence of inertial manifolds with the asymptotic completeness property. Furthermore it is shown that the “strong squeezing property” implies directly the existence of such an inertial manifold. There follows a brief discussion of the rôle of the cone condition in the Lyapunov-Perron fixed point method of proof, and a comparison with previous results.

MSC:

- [34C30](#) Manifolds of solutions of ODE (MSC2000)
- [35B40](#) Asymptotic behavior of solutions to PDEs
- [35G10](#) Initial value problems for linear higher-order PDEs
- [35K25](#) Higher-order parabolic equations

Cited in **1** Review
Cited in **5** Documents

Keywords:

cone condition; invariant manifolds for dissipative flows; strong squeezing property; inertial manifolds; exponential attraction; asymptotic completeness property; Lyapunov-Perron fixed point method