
ON DETERMINING THE HOMOLOGICAL CONLEY INDEX OF POINCARÉ MAPS IN AUTONOMOUS SYSTEMS

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We consider the continuous-time dynamical system generated by a smooth vector-field. We assume the system is rotating, i.e. the vector-field is one-side directed and transversal to the levels of some projection of the phase space onto the unit circle. This implies, in particular, the existence of a global section. We call the first-return map to the section a Poincaré map. That map determines qualitative properties of the system; for example the periodic orbits of the system correspond to the stationary and periodic points of the map. The existence of such points can be detected by the homological Conley index associated to an isolated invariant set of the discrete-time dynamical system generated by the map. In the talk we will present a theorem on determining the homological Conley index if there is lack of information on the values of the Poincaré map and its approximations, but a suitable information on some singular cycles for an index pair with respect to a discretization of the continuous-time system is provided. The talk is based on the paper published in *Topol. Methods Nonlinear Anal.* 60, No. 1 (2022).

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