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Existence, persistence and structure of integral manifolds in the neighbourhood of a periodic solution of autonomous differential systems. (English) [Zbl 0611.34045](#)

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The authors consider the existence and structure of integral manifolds near a periodic solution of a system of autonomous ordinary differential equations (*) $dx/dt = f(x, \lambda)$ and their persistence when λ changes in a metric space. To this end special local coordinates are constructed in a neighbourhood of the family of periodic solutions under consideration. So they obtain a nonautonomous system of differential equations whose qualitative behaviour near the stationary solution at the origin uniquely defines the topological structure of the trajectories of the system (*). The authors investigate existence, persistence and structure of integral manifolds of the derived nonautonomous system and prove that these integral manifolds are homeomorphic either to $R^k \times S^1$ where S^1 denotes the unit circle in R^2 , or to $R^{k-1} \times \mathcal{M}^2$ where \mathcal{M}^2 is the Möbius strip.

MSC:

[34C45](#) Invariant manifolds for ordinary differential equations

[34C25](#) Periodic solutions to ordinary differential equations

[37C10](#) Dynamics induced by flows and semiflows

Keywords:

[integral manifolds](#); [autonomous ordinary differential equations](#); [Möbius strip](#)

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