1078-34-351   **João P. F. Teixeira*** (`jteix@math.ist.utl.pt`), Av. Rovisco Pais, 1049-001 Lisboa, Portugal.
Existence of periodic solutions of ordinary differential equations.

We prove a general result of existence of a periodic solution, $y \in C^1(\mathbb{R}, \mathbb{R}^l)$, of a first order differential equation $\dot{y} = f(t, y)$, where f is periodic with respect to t and admits a star-shaped compact set that is invariant under the Euler iterates of the equation with sufficiently small time-step. As in Peano's Theorem for the Cauchy problem, the only required regularity condition on f is continuity. We present two nontrivial examples that illustrate the usefulness of this theorem in applications related to forced oscillations.

We also discuss a generalization of this result to delay differential equations of the type $\dot{y} = f(t, y, y(t - T))$, under similar conditions on f. (Received December 13, 2011)