Perturbations of asymptotically stable differential systems.

Pinto, Manuel

We consider systems of differential equations of the form (1) $x' = f(t,x)$, for $t \in [a,\infty)$, x in some domain $D \subseteq \mathbb{R}^n$ and $f \in c^1([a,\infty) \times D)$ (a a fixed real number). We assume that the solution $x(t,t_0,x_0)$ of (1) defined for $t \geq a$ satisfies $|x(t,t_0, x_0)| \leq c|x_0| h(t) h(t_0)^{-1}$ ($t \geq t_0 \geq a$) for x_0 small enough, for some constant $c > 0$ and h a continuous positive function defined in $[a,\infty)$. We give conditions for the perturbed system $y' = f(t,y) + g(t,y)$ ($g \in c([a,\infty) \times D)$) to have the same type of stability as (1). 1980 Mathematical subject classification. 34 C 11; 34 D 10.