Li, Zhengguo; **Soh, Cheong Boon**; **Xu, Xinhe**
Stability of impulsive differential systems. (English) ｜Zbl 0899.34010｜
J. Math. Anal. Appl. 216, No. 2, 644-653 (1997).

The authors study Lyapunov stability in terms of two measures of differential systems with variable impulse times:

$$x'(t) = f(t, x), \quad t \neq \tau_k(x), \qquad x(t^+) - x(t^-) = I_k(x), \quad t = \tau_k(x), \; k = 1, 2, \ldots$$

Previously, the problem was investigated in *V. Lakshmikantham* and *X. Z. Liu* [Stability analysis in terms of two measures, Singapore, World Scientific (1993; Zbl 0797.34056)] where the Lyapunov function was supposed to be nonincreasing as each "switching" happens and also within two switchings. In this paper, the authors relax these two conditions only requiring the Lyapunov function to be nonincreasing along each subsequence of the switching and only bounded within two switchings.

Reviewer: Manuel Pinto (Santiago)

MSC:

34A37	Ordinary differential equations with impulses
34D20	Stability of solutions to ordinary differential equations

Cited in **11** Documents

Keywords:

discrete and continuous time dynamical systems; impulsive systems; variable impulse times; differential equation; (non)linear systems; stability; two measures; switching; Lyapunov functions

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References:

[1] Lakshmikantham, V.; Liu, X. Z., Stability Analysis in Terms of Two Measures, (1993), World Scientific Singapore · Zbl 0797.34056

[2] Lakshmikantham, V.; Liu, X., On quasi-stability for impulsive differential systems, Nonlinear Anal., 13, 819-828, (1989) · Zbl 0688.34032

[3] Lakshmikantham, V.; Liu, X., Stability criteria for impulsive differential systems in terms of two measures, J. Math. Anal. Appl., 137, 591-604, (1989) · Zbl 0688.34031

[4] Liu, X. Z., Stability theory for impulsive differential equations in terms of two measures, Differential Equations, (1990), Dekker, p. 61-70

[5] Liu, X. Z., Practical stabilization of control systems with impulse effects, J. Math. Anal. Appl., 166, 563-576, (1992) · Zbl 0757.93073

[6] Lakshmikantham, V.; Liu, X.; Sathananthan, S., Impulsive integrodifferential equations and extensions of Lyapunov's method, J. Math. Appl. Anal., 32, 203-214, (1989) · Zbl 0653.45009