

On the Concept of Vector Characteristic Exponents in Differential-Algebraic Equations

N. T. Khuyen¹ and T. D. Phuong²

Abstract: Consider the system

$$A(t)\dot{x} + B(t)x = f(t), \quad t \in T_\infty = [0, \infty), \quad (8)$$

where A, B are $(n \times n)$ -matrix functions and f is an n -vector function of t .

For the system (8) we assume that

$$\det(A(t)) \equiv 0. \quad (9)$$

Systems of the form (8) satisfying condition (9) are commonly called differential algebraic equations (DAEs). They play an important role in various applications.

In this talk, the concept of vector characteristic exponents (introduced by Hoang Huu Duong for studying the stability of the ordinary differential equations) is developed for DAEs (8).

We also give some stability criteria for DAEs (9).

^{1,2} Institute of Mathematics, Vietnam Academy of Science and Technology
18 Hoang Quoc Viet Road, Cau Giay District, 10307 Hanoi, Vietnam
ntkhuyen@math.ac.vn, tdphuong@math.ac.vn