A continuous separation of tipe II. Applications to nonautonomous delay differential equations.

SYLVIA NOVO[1], RAFAEL OBAYA[2], ANA M. SANZ[3]

[1] *Departamento de Matemática Aplicada, Escuela de Ingenierías Industriales, Universidad de Valladolid, Valladolid, Spain.*
E-mail address: sylnov@wmatem.eis.uva.es

[2] *Departamento de Matemática Aplicada, Escuela de Ingenierías Industriales, Universidad de Valladolid, Valladolid, Spain.*
E-mail address: rafoba@wmatem.eis.uva.es

[3] *Departamento de Matemática Aplicada, Escuela de Ingenierías Agrarias, Universidad de Valladolid, Soria, Spain.*
E-mail address: anasan@wmatem.eis.uva.es

Poláčik and Tereščák proved the existence of a continuous separation for a general abstract mapping Φ satisfying the usual strong monotonicity, smoothness and compactness condition. In many important applications the origin of this map is a homeomorphism F of a compact metric subset K in a Banach space X and Φ is defined by $\Phi : K \times X \to K \times X, (\omega, x) \to (F(\omega), dF(\omega)(x))$.

For nonautonomus cooperative ordinary and parabolic equations we prove that if the constant matrix defined by the superior of the partial derivatives of the vector field on a minimal set K is irreducible then the flow map of the linearized equation at certain time t_1 admits a continuous separation on $K \times X$. However this kind of results are no longer valid for nonautonomous cooperative delay differential equations. In this case the linear flow map is not eventually strongly positive but satisfies a dichotomy behavior which provides a dynamical scenario that we define as a continuous separation of type II. This scenario preserves many of the previous dynamical properties which are relevant in the applications of the theory.

References

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