

## Time scales in linear differential delayed equations

Eva Sánchez<sup>1</sup>, Ovide Arino<sup>2</sup>, Rafael Bravo de la Parra<sup>3</sup> and  
Pierre Auger<sup>4</sup>.

The aim of this work is to extend approximate aggregation of variables method to systems of linear differential delayed equations with two time scales. Due to the different time scales, the systems depend on a small parameter  $\epsilon > 0$ . The main results of the work are that, for  $\epsilon > 0$  small enough, the solutions of the perturbed system can be approximated by means of the solutions of a scalar linear differential delayed equation. The work is developed in the framework of  $C_0$ -semigroups theory

---

<sup>1</sup>Departamento de Matemáticas, E.T.S.I. Industriales, U. Politécnica de Madrid José Gutiérrez Abascal 2. 28806 Madrid, Spain (e-mail: esanchez@etsii.upm.es).

<sup>2</sup>UR GEODES, IRD-Bondy, 32 avenue Henri Varagnat, 93143 Bondy, France (e-mail: Ovide.Arino@bondy.ird.fr).

<sup>3</sup>Dep. de Matemáticas, Universidad de Alcalá, Campus Universitario, Fac. de Ciencias, 28871, Alcalá de Henares, Madrid, Spain (e-mail: rafael.bravo@uah.es).

<sup>4</sup>UMR CNRS 5558 Laboratoire de Biometrie, Genetique et Biologie des Populations Universite Claude Bernard Lyon 1 43, boulevard du 11 Novembre 1918 69622 Villeurbanne cedex, FRANCE (e-mail: pauger@biomserv.univ-lyon1.fr).