SINGULAR LIMIT OF DIFFERENTIAL SYSTEMS WITH MEMORY

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ABSTRACT. We consider differential systems with memory terms, expressed by convolution integrals, which account for the past history of one or more variables. The aim of this work is to analyze the passage to the singular limit when the memory kernel collapses into a Dirac mass. In particular, we focus on the reaction-diffusion equation with memory, and we discuss the convergence of solutions on finite time-intervals. When enough dissipativity is present, we also establish convergence results of the global and the exponential attractors. Nonetheless, the techniques here devised are quite general, and suitable to be applied to a large variety of models.

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