

# On a class of second order dynamical systems with variable coefficients associated to a nonconvex minimization

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**Abstract.** In this paper we study a class of second order dynamical systems with variable coefficients in connection with the minimization of a smooth nonconvex function. The convergence of the generated trajectories to a critical point of the objective are ensured provided a regularization of the objective function satisfies the Kurdyka-Łojasiewicz property. We also provide convergence rates for the trajectories formulated in terms of the Łojasiewicz exponent. Finally, we discuss some consequences of the results obtained concerning the second order dynamical system that is modelling Nesterov's accelerated gradient method.

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