



ON AN ALLEN–CAHN SYSTEM WITH HEAT CONDUCTION BASED ON THE MAXWELL–CATTANEO LAW

JEAN PAUL MBAMBI MASSOUKOU

Faculty of Sciences and Technology, Marien Ngouabi University
P.O. Box 69, Brazzaville, Republic of the Congo.
(E-mail: p.mbambi.maths@gmail.com)

ARMEL JUDICE NTSOKONGO

Faculty of Sciences and Technology, Marien Ngouabi University
P.O. Box 69, Brazzaville, Republic of the Congo.
(E-mail: armel.ntsokongo@umng.cg)

and

FRANCK DAVHYS REVAL LANGA

Faculty of Sciences and Technology, Marien Ngouabi University
P.O. Box 69, Brazzaville, Republic of the Congo.
(E-mail: francklanga04@gmail.com)

Abstract. Our aim in this paper is to study an Allen–Cahn system with heat conduction governed by the Maxwell–Cattaneo law and depending on a small relaxation parameter $\varepsilon > 0$. We prove the existence, uniqueness and regularity of solutions. We then establish the existence of an exponential attractor for the associated dynamical system. Finally, we prove that the solutions converge, on finite time intervals, to those of the corresponding Cahn–Hilliard system with temperature as $\varepsilon \rightarrow 0^+$, together with suitable ε -uniform error estimates. We also present an equivalent reformulation of the problem based on an auxiliary variable.

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