SpringerBriefs in Mathematics

SpringerBriefs in Mathematics showcases expositions in all areas of mathematics and applied mathematics. Manuscripts presenting new results or a single new result in a classical field, new field, or an emerging topic, applications, or bridges between new results and already published works, are encouraged. The series is intended for mathematicians and applied mathematicians.

BCAM SpringerBriefs

BCAM *SpringerBriefs* aims to publish contributions in the following disciplines: Applied Mathematics, Finance, Statistics and Computer Science. BCAM has appointed an Editorial Board, who evaluate and review proposals.

Typical topics include: a timely report of state-of-the-art analytical techniques, bridge between new research results published in journal articles and a contextual literature review, a snapshot of a hot or emerging topic, a presentation of core concepts that students must understand in order to make independent contributions.

Please submit your proposal to the Editorial Board or to Francesca Bonadei, Executive Editor Mathematics, Statistics, and Engineering: francesca.bonadei@springer.com

basque center for applied mathematics

More information about this series at http://www.springer.com/series/10030

Alain Haraux · Mohamed Ali Jendoubi

The Convergence Problem for Dissipative Autonomous Systems

Classical Methods and Recent Advances

bcam
basque center for applied mathematics

Springer

Alain Haraux
Laboratoire Jacques-Louis Lions
Sorbonne Universités, UPMC Univ Paris 06, CNRS, UMR 7598
Paris
France

Mohamed Ali Jendoubi
Institut Préparatoire aux Etudes Scientifiques et Techniques
Université de Carthage
La Marsa
Tunisia

and

Faculté des sciences de Tunis, Laboratoire EDP-LR03ES04
Université de Tunis El Manar
Tunis
Tunisia

ISSN 2191-8198 ISSN 2191-8201 (electronic)
SpringerBriefs in Mathematics
ISBN 978-3-319-23406-9 ISBN 978-3-319-23407-6 (eBook)
DOI 10.1007/978-3-319-23407-6

Library of Congress Control Number: 2015949305

Springer Cham Heidelberg New York Dordrecht London

Printed on acid-free paper

Springer International Publishing AG Switzerland is part of Springer Science+Business Media (www.springer.com)

Preface

The initial motivation for the present text was the desire to provide an up-to-date translation of a monograph written in French by the first author, taking account of the more recent developments in infinite dimensional dynamics based on the Łojasiewicz gradient inequality.

While preparing the project, it appeared that it would not be easy to cover the entire scope of the French version within a reasonable amount of time owing to the fact that the non-autonomous systems require sophisticated tools which have undergone major improvements during the past decade.

In order to limit the present work to a modest size and to make it available to readers without unnecessary delay, we decided to produce a first volume dedicated to the so-called convergence problem for autonomous systems of dissipative type. We hope that this volume will help the interested reader to make connection between the relatively simple background developed in the French monograph and the technical specialized literature on the convergence problem, which has expanded rather rapidly in recent years.

Paris, France — Alain Haraux
La Marsa, Tunisia — Mohamed Ali Jendoubi

Acknowledgements

This book is the result of an intensive franco–tunisian collaboration between the PDE Laboratory of the University of Tunis El Manar and the Laboratory J.L. LIONS of Paris. In particular, we wish to thank the foundation “Sciences Mathématiques de Paris” and the french C.N.R.S. for the financial support of two pure research stays of the second author in Paris. Finally, an invited professor position offered by University Pierre et Marie Curie to the second author was decisive in obtaining the present version of this work, and we are especially grateful to the collegues who made such an invitation possible.

Contents