the book. The proposed methods are methodically analysed and numerically simulated, evaluated and compared against published research in the field.

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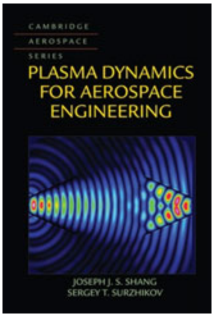

Plasma Dynamics for Aerospace Engineering

J. J. S. Shang and S. T. Surzhikov

Cambridge University Press, University Printing House, Shaftesbury Road, Cambridge CB2 8BS, UK. 2018. xiv; 387 pp. Illustrated. £89.99. ISBN 978-1-108-41897-3.

This book aims to summarise the development of plasma physics over the past 50 years and to link this development to aerodynamics. The authors are two very experienced researchers who have made substantial contributions to the application of computational plasma physics to aerodynamics, among other things.

One important emphasis that is made in the book is the interdisciplinary nature of this subject, with computations often requiring a complex mixture of scales from the quantum to continuum level. The target audience is aerospace engineers and researchers who wish to explore how plasmas can affect aerodynamics. The approach taken in the book is to present many of the fundamental aspects of plasma physics, a daunting task given at least 50 years of development.

The treatment of topics is at best brief, so this book cannot really be used as a stand-alone textbook for plasma physics. Each chapter, however, can be treated (approximately) as a separate essay, and all the chapters contain an impressive list of references at the end. Thus, a reader can pick and choose a topic of interest in a particular chapter, together with further reading for a more comprehensive study, and not be adversely affected by not having read the preceding chapters serially. Most of the basic plasma physics material can be found elsewhere, in more established textbooks and in much more detail. Therefore, it is of regret that the authors did not spend more time on computational aspects and applications, on which they are both respected experts. There are chapters on numerical solution procedures, but the space dedicated to them is limited due to the daunting scope of the book. Although applications are discussed throughout the book, the final chapter presents a very interesting collection of plasma applications including ion thrusters, plasma actuators for flow control and plasma-assisted ignition. The topics of this chapter would be of interest to researchers in other areas of plasma physics (e.g. astrophysical plasmas) as there is much cross-over in the types of numerical methods useful for tackling these problems.

Apart from the briefness of the treatment of basic plasma physics (which is necessary if the book is to remain under 1,000 pages!), there are other detrimental aspects. First, the quality of the written English is very poor in places. This is somewhat surprising given the reputation that Cambridge University Press has in academic books. Secondly, and more importantly, many of the equations contain errors. Most of these errors are (probably) typographical, such as the wrong symbol included in one of Maxwell's equations (page 154, Equation (5.10b)) or an incorrect sign in the induction equation (page 171, Equation (5.28c)). These are just two examples, but there are, unfortunately, many others, and a reader must work through the equations carefully and cannot be too trusting of those presented in the text. Apart from typographical errors, there are also some more serious conceptual problems. In chapter 3, introducing Maxwell's equations, the divergence theorem is not applied correctly. For example, the jump from equation (3.1a) to (3.1b) is not correct. The consequence of this is that the localisation argument to find Maxwell's differential equations is not correct, e.g. moving from the (incorrect) integral form in equation (3.1c) to the differential form in equation (3.1d).

In short, this book is a collection of almost distinct chapters that can whet the appetite of a reader interested in the application of plasma physics to aerodynamics. Much of the treatment focusses on basic plasma physics, and this content can be considered as a starting point for a more in-depth study necessary to understand these basics. There is some interesting description of the authors' research work, but, sadly, this is dwarfed by the space given to explaining basic plasma physics. The significant errors in the written English and the equations are highly detrimental to the readability of the book. If a second edition of this book is being considered, the authors and the publisher need to address these concerns seriously. The authors may also consider expanding sections on numerical methods and applications. After all, they are experts on these topics and readers would, I think, be more interested in discovering the latest developments in this fascinating field rather than reading yet another treatment of basic plasma physics.

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Morphing Wing Technologies: Large Commercial Aircraft and Civil Helicopters

Edited by A. Concilio *et al.*

Elsevier Butterworth-Heinemann,
The Boulevard, Langford Lane, Kidlington,
Oxford OX5 1GB, UK. 2017. lv; 911 pp.
Illustrated. £160. ISBN 978-0-08- 100964-2.

This book presents a general introduction and comprehensive review of state-of-the-art Morphing Wing Technology (MWT) at sub-system and aircraft level. It is well structured, well written and edited with rich literature in the subject. It provides useful knowledge and a wide scope of MWT through case studies from completed research programmes. After so much research effort and achievement in this field over a couple of decades, it is indeed the right time to produce such a book on this particular subject. Although the book is produced in the form of a compilation of technical reports and papers, some of the figures need more editing effort for

https://doi.org/10.1017/aer.2020.111 Published online by Cambridge University Press