The field of aerospace is wide ranging and covers a variety of products, disciplines and domains, not merely in engineering but in many related supporting activities. These combine to enable the aerospace industry to produce exciting and technologically challenging products. A wealth of knowledge is contained by practitioners and professionals in the aerospace fields that is of benefit to other practitioners in the industry, and to those entering the industry from University.

The Aerospace Series aims to be a practical and topical series of books aimed at engineering professionals, operators, users and allied professions such as commercial and legal executives in the aerospace industry. The range of topics is intended to be wide ranging covering design and development, manufacture, operation and support of aircraft as well as topics such as infrastructure operations, and developments in research and technology. The intention is to provide a source of relevant information that will be of interest and benefit to all those people working in aerospace.

Modelling of systems is a valuable aid to understanding system behaviours and to assisting with trade-off and selection of candidate solutions. Using models and simulations to replace physical mock-ups and test rigs also makes a significant contribution to reducing project costs and time-scales. It is now second nature for engineers to develop quite sophisticated models and simulations of their systems and to use them as the basis of debate and agreement of system behaviours, and to develop an understanding of system interactions.

This book, Computational Modelling and Simulation of Aircraft and the Environment: Volume 1 – Platform Kinematics and Synthetic Environment provides an insight into the use of models and simulations, as well as the system environment they inhabit, to provide analysis and information which is used to support the design and certification of aircraft systems. The first stage in this process is to understand how to develop a consistent understanding of the outside world in which models and simulations exist. This is followed by the development of specific system models to integrate with this synthetic world to be published as a companion volume – Aerospace Vehicles and Flight Dynamics. The result of this combination is a set of tools and techniques which produce robust and trustworthy design information.

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