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Preface to Nonlinear flight dynamics of high-performance aircraft. A Theme compiled and edited by J. M. T. Thompson and F. B. J. Macmillen.

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Preface

This Theme Issue contains a collection of papers that apply the modern techniques of nonlinear dynamical systems theory to the flight dynamics of high-performance aircraft. These global and versatile methods can be usefully applied in a wide range of aerospace applications, and will undoubtedly play a vital role in the future. Here, each paper highlights different aspects and applications of the analytical techniques and looks ahead to further developments.

Each year at the specialized annual conferences on flight dynamics, more and more papers are presented on the application of such techniques under the names of 'bifurcation analysis', 'global stability analysis', etc. It is therefore surprising that, after two decades of such research, the aircraft industry has yet to adopt such techniques in the design process.

In this collection of carefully selected authoritative papers, it is hoped that the benefits as well as the current limitations of these techniques may be made clear both to the aircraft industry and to the wider general readership of the *Philosophical Transactions*. The Theme starts with a general introduction, which serves as a tutorial and review covering the basics of the nonlinear theory and fundamentals of flight mechanics.

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