

Book Reviews

Monocoque, Sandwich, and Composite Aerospace Structures, Selected Papers of Nicholas J. Hoff, Technomic Publishing Company, Inc., Lancaster, PA, 1986, 598 pp., \$65.00.

Professor Hoff is well known to most, if not all, practitioners of the art and science of aerospace structures. Since his papers span a 50-year period, the full depth and breadth of his contributions have not been as widely appreciated as they should have. This volume makes the most important of his papers available, in one source, to students, practicing structures specialists, and researchers.

This book contains an interesting biographical sketch of Professor Hoff written by Professor B. A. Boley, a listing of Professor Hoff's principal awards and honors (27 of them, from 10 countries), and reprints of 49 of his papers and reports.

The papers are conveniently grouped into five parts. Part I contains nine papers on buckling of columns and frameworks. Of particular interest are several pioneering papers on dynamic buckling. Part II contains thirteen papers on smooth or reinforced shells. Here particular emphasis is placed on circular cylindrical shells, but there is also one paper each on conical and spherical shells. Of particular significance are the papers on low buckling loads of axially compressed cylinders.

Parts III and IV contain eight papers on thermal effects on structures and twelve on creep effects. In view of the renewed interest in hypersonic aircraft, such as the National Aerospace Plane Project, these papers are as relevant today as they were when first presented 10 to 30 years ago.

Part V contains seven papers on sandwich and composite structures. These include three pioneering papers by Hoff and Mautner on sandwich structures and three recent ones on stress concentrations in cylindrically orthotropic plates with holes.

This volume is a fitting tribute to Professor Hoff on his 80th birthday. Because of his combination of physical insight, sufficient mathematical analysis (either analytical or numerical as required by the problem), and comparison with carefully conducted experiments, Professor Hoff's papers are models for all subsequent investigators to emulate. This volume is highly recommended to all serious students, practitioners, and researchers in aerospace structures or other thin-walled structures.

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Spacecraft Attitude Dynamics, by Peter C. Hughes, John Wiley & Sons, Inc., New York, 1986, 564 pp., \$47.95.

Peter Hughes has produced a comprehensive treatise on the topic of satellite attitude dynamics. The book is structured in a logical manner, well-written with adequate illustrations (over 250), and designed as a text with 175 exercises for the student. Contents are restricted to attitude dynamics, with the intentional exclusion of topics on orbit mechanics and attitude control. A five-page introductory chapter explains the approach taken and limitations of the subject matter covered, while fundamentals of kinematics and attitude dynamics are reviewed in the next two chapters. Next, the torque-free motion of a rigid body is examined, followed by a treatment of energy dissipation effects. These chapters are followed by a similar pair on dual-spin torque-free motion and energy dissipation effects. Of the 11 chapters, the last four deal with environmental torques, gravitational stabilization, spin stabilization, and dual-spin stabilization.

The student reader will find it necessary to be well-grounded in vector analysis, dynamics, and matrix

algebra. Some undergraduate training in spacecraft orbit and attitude dynamics will be of considerable help. The material is occasionally tedious and too extensive for academic training purposes. The exercises are challenging and educational.

The satellite engineer using this as one of several references available, will appreciate the extensive treatments of dynamical motion for various spacecraft types. The 350 reference entries are helpful in beginning a search for additional material on related topics.

In summary, this book represents a useful and well-written addition to other available volumes on spacecraft dynamics and control. Graduate students and spacecraft professionals will find it to be a comprehensive source for training and information on the topic.

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