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Titolo	Simulation of Thermoelastic Behaviour of Spacecraft Structures : Fundamentals and Recommendations / / by Simon Appel, Jaap Wijker
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Soggetti	Aerospace engineering Astronautics Thermodynamics Heat engineering Heat transfer Mass transfer Mechanics, Applied Solids Outer space - Exploration Aerospace Technology and Astronautics Engineering Thermodynamics, Heat and Mass Transfer Solid Mechanics Space Exploration and Astronautics
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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Thermoelastic verification -- Occurrence of thermoelastic phenomenon in Spacecraft -- Physics of thermoelastics -- Modelling for thermoelastic -- Thermal modelling for thermo-elastic analysis -- Structural modelling for thermoelastic analysis -- Transfer of thermal analysis results to the structural model -- Prescribed Average Temperature Method -- Generation of linear conductors for lumped parameter thermal models -- Estimating uncertainties in the thermoelastic analysis process -- Solutions.
Sommario/riassunto	This book provides recommendations for thermal and structural

modelling of spacecraft structures for predicting thermoelastic responses. It touches upon the related aspects of the finite element and thermal lumped parameter method. A mix of theoretical and practical examples supports the modelling guidelines. Starting from the system needs of instruments of spacecraft, the reader is supported with the development of the practical requirements for the joint development of the thermal and structural models. It provides points of attention and suggestions to check the quality of the models. The temperature mapping problem, typical for spacecraft thermoelastic analysis, is addressed. The principles of various temperature mapping methods are presented. The prescribed average temperature method, co-developed by the authors, is discussed in detail together with its spin-off to provide high quality conductors for thermal models. The book concludes with the discussion of the application of uncertainty assessment methods. The thermoelastic analysis chain is computationally expensive. Therefore, the 2k+1 point estimate method of Rosenblueth is presented as an alternative for the Monte Carlo Simuation method, bringing stochastic uncertainty analysis in reach for large thermoelastic problems.