

MATERIALS AND STRUCTURES SYMPOSIUM (C2)
Space Structures - Dynamics and Microdynamics (3)

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ANALYSIS AND VERIFICATION OF MICRO-VIBRATIONS ON SATELLITE LEVEL

Abstract

This paper presents several aspects of microvibrations with focus on their effects and characterization possibilities on spacecraft level. Consequently, the topic is being considered from a systems integrators point of view, as opposed to unit (generation side) or payload (target side) level viewpoints.

First, an overview about types of missions and applications for which microvibrations are relevant is given. To this end, the specific susceptibility properties to microvibrations for different payload classes (e.g. optical, clocks, lasers) are highlighted. On the other hand, an overview of microvibration sources like Reaction Wheels or mechanism and their typical microvibration characteristics is given. In some more detail, aspects of microvibrations in terms of technical characterization options and requirements are considered. The emphasis is being laid on appropriateness of the characterization on the specific properties of microvibration sources and sinks. Examples are options like time-frequency representations for non-stationary microvibrations, narrowband vs wideband spectra or time-domain requirements. Moreover, typical possibilities for measuring microvibrations on unit and on satellite level are summarized with special emphasis on concrete activities and approaches used at OHB. Finally, an outlook towards simulation tools for microvibration generation and transmission is given.