

IAF SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2)
Advanced Satellite Services (5)

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SUCCESSFUL SMART MATERIAL FOR SATELLITE ANTENNA

Abstract

Nanosatellites are an emerging subject in the field of space technology. Keeping in mind the constraints and nature of satellites, it is of importance to cautiously analyze components that are to be utilized on board. Based on the research and work conducted, the idea was to examine the scope that antennas provide for further developments. The most important attributes of an antenna are its dimensions, disposition and its material. While focusing on the material of an antenna, the properties and behaviour of Shape Memory Alloys (SMA) were promising. The memory metals are a distinctive category of metal alloys that have the capability of remembering their original shape. The phenomenon of returning to the original geometry after a large inelastic deformation is the Shape Memory Effect. The aim was to control the pointing errors of antennas owing to the probable vibrations and optimum temperature control for antennas during situations that demand temperature compensation. This paper further discusses the prospects of antennas being built of SMAs. Active methods were assessed to cope with its shortcomings such as the above mentioned including their properties such as radiation patterns, material strength and, behaviour in the hostile environment.