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AN EXPERIMENTAL STUDY OF SMA BASED LINEAR ACTUATOR FOR CONTROLLING THE OPEN AND CLOSE OPERATION OF LIGHT SOLAR SAIL PROTOTYPE

Abstract

The solar sail has been playing a major role in de-orbiting. It was introduced to deploy sail which can open and close. The existing solar sail actuation is mostly based on the origami model. This paper is about the smart material implementation for robotic application. The design and assembling of a mini version of the light solar sail have been developed here. The main task is to open and close the solar sail with basic control. The shape memory alloy (SMA) based linear actuator has been used for controlling the open and close operation of the light solar sail. The structural details of the light solar sail with SMA based linear actuator have been demonstrated as well. This experimental study is about power requirement with respect to the opening and closing operation of the light solar sail. It's aimed to obtain minimum power consumption for closing and opening of the solar sail with SMA based linear actuator. This kind of setup can be used further for real-time space exploration with robust version.