

IAF SPACE POWER SYMPOSIUM (C3)
Interactive Presentations - IAF SPACE POWER SYMPOSIUM (IPB)

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SOLAR ENERGY HARVESTING USING MEMS CANTILEVER BEAM FOR SPACE APPLICATION

Abstract

The Micro-Electro Mechanical System (MEMS) is an emerging alternative where energy is obtained from the natural sources, in general energy harvesting, is the conversion of ambient energy into usable electrical energy. Hence in this paper the design of the MEMS cantilever beam for energy harvesting as an example to discuss mechanical principle and function simulation of the space solar MEMS applications is presented, it is a question to study the influence of various parameters on the system energy harvesting, and the variation modes of the system. The bilayer cantilever made of two different materials is displaced at the free end by absorbing the solar radiation energy that develops the stress at the fixed end and thus the solar radiation is converted to mechanical energy and the energy can be readily converted to electrical energy by using either capacitive or piezoelectric energy harvesting techniques. This paper discusses the significant structural elements in the energy harvesting using MEMS technology and the results obtained show that the parameters have a considerable effect on the solar energy system, the variation of the power absorbed by the cantilever according the length for different value of w_0 is presented and the first mode of natural frequency of the system, which is about 71 Hz, gives the better the vibration direction.