

IAF MATERIALS AND STRUCTURES SYMPOSIUM (C2)  
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DEVELOPMENT AND VIBRATION ANALYSIS OF AN ON-ORBIT 3D PRINTER

**Abstract**

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**Abstract**

Due to the increasing demands of on-orbit servicing, In-Space Manufacturing (ISM) is becoming an essential technology in the space industry. On-orbit additive manufacturing reduces the cost of space operations because many satellites and spacecraft components could be manufactured in space without any launches from the earth. This paper developed a novel 3D printer structure that enables on-orbit 3D printing as part of a manufacturing facility—then optimizing vibration characteristics to reduce mechanical vibrations to increase the fidelity of the 3D printing product was investigated. Modal analysis technique was used to acquire the frequency of the vibrations caused by the 3D printer structure. Lastly, the 3D printer structure will be optimized based on the modal analysis results.