

IAF MATERIALS AND STRUCTURES SYMPOSIUM (C2)
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EVALUATION OF A VARIETY OF WOOD MATERIAL IN CUBESAT STRUCTURES

Abstract

Small satellites known as "CubeSats" adhere to a set of standards, making them less expensive to develop and launch than traditional satellites. A CubeSat's carefully thought-out structural design reduces weight and improves mission success rates. The mass budget allotted to the payload and other subsystems would rise as a result. The CubeSat's structure needs to be strong and stiff enough to sustain the other components in addition to being lightweight. This study evaluates wood material as a CubeSat structure. In this study, various wood material types were assessed in a 1U CubeSat structure. To confirm that the suggested structure satisfies the criteria of the CubeSat design specifications, several finite element simulations were carried out. Analyses of the CubeSat structure's modal and quasi-static simulations were both performed. The findings reveal that the suggested structure has a much lower mass when compared to a CubeSat structure that is commercially accessible and has a flight heritage. Moreover, this is seen as substantial when compared to the usual mass of a fully assembled 1U CubeSat, which is in the range of 2.0 kg. The outcome shows that the suggested structure is feasible to be used in future CubeSat missions as it complies with all CubeSat dimensions, stiffness, and strength requirements.