

Construction of impact testing machine for small satellites and evaluation of mechanical resistance of MCPs by the impact test

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Small satellites have been developed in recent years. Environmental tests at the development stage play an important role in improving reliability of small satellites. These include a vibration test, an impact test, and a thermal vacuum test. Especially, the impact test is one of the most difficult tests and a reliable method has not yet been established. Against such a background, we constructed an impact testing machine for small satellites. Required performance of the impact testing machine is a controllability and a reproducibility. The controllability means the performance of applying a targeted impact level accurately. This is important to avoid applying excessive impacts on a test target. The reproducibility means the performance of applying same impact level repeatedly and this is also important because if it is possible to apply an unintended impact under the same condition, it degrades the test accuracy. Our impact testing machine is designed to be able to easily adjust the impact level and have high reproducibility. Furthermore, we tested for mechanical resistance of the MCP (micro-channel plate) which is used for optical observation instruments. In this test, we used an impact level assuming the EQUULEUS mission which will be launched by NASA's rocket in 2020. In my presentation, I will introduce the details of our impact testing machine and the impact test results of MCP.

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