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THE STUDY OF POINTING ACCRACY EVALUATION METHOD FOR HIGH PRECISE OBSERVATION SATELLITE

Abstract

Recently, the high pointing accuracy is required for earth observation satellites and astronomy satellites. For these satellites, one of the biggest issues to accomplish the requirement, is the micro-vibration induced by the AOCS components and actuators within mission sensors. In order to achieve the high pointing accuracy in orbit, the performance evaluation test is needed to conducted before launch. The test is the micro-vibration test with simulating the on-orbit condition to the utmost extent. In the test there are two measurement methods of the pointing stability: One is the optical measurement with the laser beam, another is inertial measurement with the inertial sensor like accelerometers and was developed for the performance evaluation of the solar observation satellite" hinode" by us. Both of methods have some advantage and some disadvantage. Especially, the advantage of the latter method is that the boundary condition in or-bit can be simulated. But in general, it was thought that the optical method is better than the inertial one. The reason is that the measurement precision of the inertial measurement method has been not fully evaluated. If the validity of the method is confirmed, the optical measurement is not necessarily required. In other words, the pointing accuracy was evaluated in better test condition. For the purpose of the evaluation of the inertial method, the micro-vibration test was conducted, using the Ds2000s satellite bus structure that is designed by MELCO, some AOCS components and the mock optical system that has the main mirror and sub mirror. In order to simulated the on-orbit vibration level, the satellite structure was excited by the micro-vibration was generated by those actuators and the pointing axis variation was measured with the above two methods. The measurement precision of the method was assessed with the comparison with the optical measurement result. This presentation

focuses on the inertial measurement method. The characteristic of the measurement method, the detail of the micro-vibration test method, and the evaluation result of the accuracy of the inertial measurement method will be mentioned.