Development of A Photogrammetry System for Use under Thermal Vacuum Environment

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The study of shape deformation in a large spacecraft such as the antenna of communication satellites and large space reflectors is essential in the design of the satellite system. A photogrammetry system can accurately measure the structural deformation of these space objects under the space environment. Photogrammetry, as its name implies, is a 3-dimensional coordinate measuring technique that uses photographs as the fundamental medium for metrology. In the last few years, the accuracy of photogrammetry has increased dramatically through the rapid advance of digital camera. The SITC(Satellite Integration & Test Center) at KARI in KOREA is equipped with a series of space environmental test facilities as like the thermal vacuum chamber. Lately manufacturing of the Large Thermal Vacuum Chamber(LTVC) with useful dimension of Φ8m×L10m is well advanced. The purpose of this study is to confirm the possibility in order to perform thermal distortion measurements of the antenna in the LTVC and to apply the result to the chamber design.