Geophysical Research Abstracts
Vol. 20, EGU2018-3980-9, 2018
EGU General Assembly 2018

Astrogeodetic Test Observation by the Newly Designed Astrogeodetic Camera System Version 2

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After 2000, Digital Zenith Camera Systems (DZCSs) were developed and provide higher accuracy measurements deflection of vertical components for application in precise geoid modeling. Using the astrogeodetic DoV, geoid height changes between ground stations are determined that lead to the astrogeodetic geoid modeling. The first DZCS, namely the Astrogeodetic Camera System (ACSYS), was developed in Turkey in 2015. It is capable of obtaining DoV with an accuracy of 0.2-0.3 arc sec, yet it has some limitations.

Since 2016, The ACSYS has been modernized through the upgrade of the system with new technological components to include hardware and software. The new DZCS design came out as a result of an update to the ACSYS, and it is named ACSYS v2. The test and calibration measurements of each component of the system such as the telescope, CCD camera, tiltmeters, the CNS Clock II, which is used for determining the time, and the temperature compensating focuser were completed. These components were re-tested and their calibration measurements were also completed with the new fully automated substructure supporting the ACSYS v2. The preliminary astrogeodetic test observations were conducted by The ACSYS v2 in the main station for 5 nights. In this study, the observation procedure, evaluation of the test data and calculations regarding these data are described.