Geophysical Research Abstracts
Vol. 21, EGU2019-8121, 2019
EGU General Assembly 2019

Photoequipment shooting automatization from an ISS board

Aliaksei Lamaka, Valery Stanchyk, Boris Belyaev, and Yuri Golubev

A.N. Sevchenko Institute of Applied Physical Problems of Belarussian State University, Department of Aerospace Research, Belarus (alekseylomako@gmail.com)

The system of orientation of video-spectral equipment (SOVE) is intended for automatization of measuring process of the spreading surfaces optical characteristics at execution of the land surface monitoring during scientific application studies in the space experiment "Hurricane" on the International Space Station (ISS). The SOVE passes tests now and allows carrying out the shooting with some photo and spectral equipment without operator participation with forecasting of shooting time for the days ahead.

Structurally SOVE represents established on support a lightproof (from the compartment ISS) rigid casing with a fastening ring lenses of the camera or other spectral-making equipment. In a casing there are two mirrors: mobile, fixed on a cardan suspension with a possibility of turn in two planes by means of the scanning drives, and motionless, directing a light stream to the reception equipment. The mobile mirror has a possibility of turn on each of axes on 15 degrees that leads to scanning of the Earth's surface in 30 degrees.

The SOVE software has access to the ISS ballistic data. Proceeding from them there is a possibility of the ISS position forecasting for the near future, using SGP4 model. However, this model works well for the ISS position tracking, constantly changeable orientation of the ISS is also important for aiming to a point on Earth. Therefore, the decision on entering of correction into the forecast for SGP4 model in real time was made. This correction was realized using the ISS turn quaternion receiving on a ISS network with a frequency of 1 Hz. This correction allows to up pointing accuracy from 5-6 degrees to 1-2.

The algorithm is realized on Qt C++ and deployed for Windows. The SOVE is going to be established onboard the ISS by the end of 2019.