Optimized directional polarization camera helps terrestrial ecosystem carbon monitoring

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Directional Polarization Camera (DPC) was equipped on terrestrial ecosystem carbon monitoring satellite recently launched. Credit: HFIPS

A terrestrial ecosystem carbon monitoring satellite was launched from

the Taiyuan Satellite Launch Center by a Long March 4B carrier rocket, and entered the planned orbit.

It was equipped with a Directional Polarization Camera (DPC) that was independently developed by a research team from Anhui Institute of Optics and Fine Mechanics, Hefei Institutes of Physical Science, Chinese Academy of Sciences.

The DPC is for obtaining multi-angle and multi-spectral polarization radiation data of the Earth's atmosphere and retrieving remote sensing data of optical and physical parameters of global atmospheric aerosols and clouds.

Thus, it can meet the needs of global climate change research and applications, achieve high-precision atmospheric correction of other optical loads on the satellite platform and support the observation of atmospheric parameters needed for the study of aerosol forced radiation effects.

This optimized DPC has many advantages compared with the old model. Parameters like spatial resolution and the number of observation angles have been improved, and new function "on-orbit cloud judgment" has been added.

The improved spatial resolution of aerosol remote sensing products enhances the ability of air pollution monitoring. And thanks to the increase of aerosol information, the DPC can better restrict the inversion of aerosol multi-parameters, which is more conducive to the inversion of surface reflectance products.

The "on-orbit cloud judgment" can be used as the basis for the load switch of other optical satellites on the same satellite platform, which leads to the prolonged service life of the load in orbit.

The satellite will monitor the distribution of atmospheric aerosols and improve the quantitative level of land remote sensing in China. It will also provide operational support and research services in fields such as environmental protection, surveying and mapping, meteorology, agriculture, and disaster reduction.

Provided by Chinese Academy of Sciences

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