



## **On-orbit calibration of the tiny ionospheric photometer**

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The Tiny Ionospheric Photometer(TIP) instrument is a compact, high sensitivity far ultraviolet photometer that observes the nighttime ionosphere of the Earth at 135.6 nm. The sensor will be on board the FY-3 meteorological satellite of China. As an optical instrument, it is necessary to have on-orbit calibration. But because of limited resources, calibration equipment could not be carried together. On order to determine and monitor the on-orbit sensitivity of the TIP instrument, an on-orbit calibration method based on the model calculation was studied. For a calculation, The peak electron density and the electron density profile were obtained from the ground-based digisonde and the neutral molecule density profile was obtained from MSIS-90 model. These parameters were the input values in the OI 135.6 nm nighttime airglow radiative transfer model which was developed and introduced in another paper. the OI 135.6 nm airglow intensity was obtained from the model. The OI 135.6 nm intensity calculated was used to revise the measured value of intensity at 135.6 nm from the tiny ions ionospheric photometer when measuring time and space conditions of both the TIP and the ground-based digisonde were consistent. The method was tested using some measured data from the TIP on COSMIC/FORMOSAT-3 satellite and the results showed the method of on-orbit were feasible.