

The photochemical model of atomic oxygen ions retrieving from ground-based observation of airglow

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To study the chemistry and composition of the upper atmosphere, we can utilize airglow emissions from the photochemical reactions of the ions in this region. When the atomic oxygen ions, which are distributed in the ionospheric F region, experience an energy level transition, visible light with a wavelength of 630 nm is released. We used the photometer system built by our team to perform ground-based observations of airglow over the sky of Taiwan at The Lulin Observatory (23°28'07"N, 120°52'25"E) during nighttime. We combined the mean values of our observations every 10 minutes with a photo chemistry model based on the formula derived from the theory of R. Link and L. L. Cogger. With this method, we can estimate how the density of oxygen atomic ions varies with time and altitude. This system will be used for long term observations to study the seasonal variation of upper atmosphere composition.

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