

Observations of the $O(^1D)$, $O_2(^1\Sigma)$ and OH airglow by the ISUAL instrument onboard the FORMOSAT-2 satellite

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In the past, using different observational techniques the mesospheric airglow emissions were documented. There is a quantitative comparison between the theoretical and experimental brightness is rather poor, because of short time scale gravity waves, strong variability of tides and the short duration of the observations. The ISUAL instrument on board the FORMOSAT-2 satellite was launched on May 21, 2004 to investigate the upper atmospheric emissions produced by lightning, airglow and aurora. The mesospheric airglow produced by $O(^1S)$, $O_2(b^1\Sigma_g^+)$, $O_2(A^3\Sigma_u^+)$ and OH Meinel bands has been observed. By using 630 nm filter $O(^1D)$ airglow emission was also observed at 200-240 km along with OH emission at 85-88 km. In this paper the FORMOSAT-2 observations of October 2004 were presented to show the characteristics of the three emissions, including the peak emission altitude, emission brightness and their spatial variabilities. The results show the variability of the airglow and their global distributions. Here we found multiple peaks in the OH and $O_2(\Sigma)$ air glow emissions. The global distribution of the airglow enhancement in the mid latitudes of the northern hemisphere (NH) is observed.