



Auroral observation using NIR camera onboard balloons: A new approach for dayside auroral observations

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Since the interplanetary shock created earth dayside aurora was found from UV imager onboard NASA spacecraft Polar, scientists have been looking for methods to observe the aurora closely in order to identify the auroral forms that indicate the auroral particle acceleration mechanisms. The most promising method is to fly high-altitude long-duration balloons above the Antarctic using a near-infrared (NIR) camera. The brightness of the sunlit atmosphere makes auroral observation very difficult. Model results show that the sky brightness diminishes as altitude and wavelength increases and that the bright auroral N₂⁺ Meinel emissions are comparable to the sunlit sky brightness above 45 km altitude. To test this theory, we have done an auroral test observation at the Poker Flat Research Range using a JPL built NIR camera. Significant auroras were observed during the night time and twilight when the sky brightness is similar to that at the altitudes 45 - 50 km.