

Researchers reveal early results in sky-brightness measurements in Antarctica

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A research team led by the researcher Wang Jian from the University of

Science and Technology of China (USTC), collaborating with the Polar Research Institute of China, developed the Near-Infrared Sky Brightness Monitor (NISBM) for measurements at DOME A. Their work was published in *Monthly Notices of the Royal Astronomical Society (MNRAS)* on March 21.

The Antarctic, with its unparalleled climate and geographical conditions, is considered to be the best candidate for observing infrared bands on Earth. Despite the extreme conditions of low temperature, high altitude, low pressure, and power difficulties of Dome A in Antarctica, Wang's team completed the NISBM for Dome A in 2018 with the advantage of InGaAs detector in J, H, and Ks bands.

Researchers carefully analyzed the preliminary Antarctic observations obtained by NISBM for Dome A and concluded that when the solar altitude angle decreases to a specific inflection point, the background intensity of the sky in this band will no longer be influenced by the sun. By calculating and analyzing the zenith angle data, the sky background intensity of Antarctic Dome A in J, H, and Ks bands are $600 \sim 1100 \mu\text{J}_y \text{ arcsec}^{-2}$, $1100 \sim 2600 \mu\text{J}_y \text{ arcsec}^{-2}$, $200 \sim 900 \mu\text{J}_y \text{ arcsec}^{-2}$, respectively.

Compared with the stations at low latitudes and [high altitudes](#), DOME A has a significantly lower brightness in the Ks band, which is comparable to the South Pole. This indicates that DOME A is an excellent site for Ks-band [astronomical observations](#).

More information: Jun Zhang et al, Sky-brightness measurements in J, H, and Ks bands at DOME A with NISBM and early results, *Monthly Notices of the Royal Astronomical Society* (2023). [DOI: 10.1093/mnras/stad775](https://doi.org/10.1093/mnras/stad775)

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