

OPTICAL/INFRARED ASTRONOMY ON THE ANTARCTIC PLATEAU: REVIEW OF SITETESTING

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The favourable atmospheric conditions above Antarctica offer many advantages over temperate latitude observatories for optical and infrared astronomy. A decade of site testing at the South Pole, and more recently at Dome C, has quantified the atmospheric transparency, emissivity, turbulence, and cloud cover.

The most exciting result from this work has been the 2-3 times improvement in image sharpness that is possible from Dome C due to the low levels of atmospheric turbulence. These results, verified by two groups using entirely different techniques in 2004 and 2005, places Antarctica firmly in the gap between traditional ground-based observatories and space telescopes. The time is now ripe for the deployment of a medium-sized telescope, e.g., one with a 2 metre aperture, to prove that the expected performance can be reached in practice. In parallel with the construction of such a telescope, the remaining site-testing issues, such as the height of the boundary layer and the conditions at more remote sites such as Dome A, can be addressed.

The image on the left below shows a simulated star field observed from a temperate-latitude observatory. The image in the middle is the view from Dome C with the same sized telescope. The image on the right is the mid-latitude view with a 2.5 times larger telescope.

