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OPTICAL SKY BRIGHTNESS AT DOME C, ANTARCTICA

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Dome C, Antarctica is a prime site for astronomical observations in terms of climate, wind speeds and turbulence. The infrared and terahertz sky backgrounds are the lowest of any inhabited place on Earth. However, at present little is known about the optical sky brightness and atmospheric extinction. Using a variety of modelling techniques together with data from the South Pole, we estimate the brightness of the night sky including the contributions from scattered sunlight, moonlight, aurorae, airglow, zodiacal light and artificial sources.

We compare our results to another prime astronomical site, Mauna Kea. We find moonlight has significantly less effect at Dome C than at Mauna Kea. Aurorae are expected to have a minor impact at both sites, and zodiacal light is expected to be less at Dome C than at Mauna Kea. Airglow emissions at Dome C are expected to be similar to those at temperate sites. With proper planning, artificial sources of light pollution should be non-existent. The overall atmospheric extinction, or opacity, is expected to be the minimum possible.

We conclude that Dome C is a very promising site not only for infrared and terahertz astronomy, but for optical astronomy as well.