



AURORAL PHENOMENA AT MAWSON, ANTARCTICA.

*A thesis for the degree of Master of Science  
in the University of Adelaide.*

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*December 1969*

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ACKNOWLEDGMENTS 58

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### ABSTRACT

Using a multichannel photometer with narrow band-pass filters, the intensities of the night sky emissions of  $\lambda 5577\text{\AA}$  and  $\lambda 6300\text{\AA}$  of [O I],  $\lambda 4278\text{\AA}$  of  $N_2^+$  and doppler shifted  $H_\beta$  were measured at Mawson, Antarctica.

Plotting the intensities with the time of onset of slowly varying ionospheric absorption events (SVIA) as origin presents an ordered picture which is shown to be consistent with the auroral substorm concept developed by Akasofu. The phenomena accompanying SVIA events are also consistent with the midnight sector poleward bulge phase of the auroral substorm model. Enhanced  $H_\beta$  emission occurred during every SVIA recorded. The simultaneous onset of SVIA events at Mawson, Murmansk and Kiruna on three occasions indicates that SVIA are not localised phenomena.

The distribution of the mantle aurora is found not to lie along the quiet auroral oval, but along lines of constant colatitude. The measured ratios of the intensities of  $\lambda 5577\text{\AA}$  [O I] and  $\lambda 6300\text{\AA}$  [O I] to  $H_\beta$  in proton auroras are much greater than previously reported values.

A procedure for absolute calibration of narrow band-pass filter photometers is outlined.

The derivation of a new geomagnetic "L" co-ordinate system based on McIlwain's "L" parameter is given.

On August 11 and 14 1966 unusual patches of luminosity were observed in the twilight sky. The possibility of their having been aurora or noctilucent clouds is considered, and it is concluded that they were noctilucent clouds at an unusually high altitude.