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SPORADIC-E STUDIES OVER SOUTHERN HEMISPHERE GEOMAGNETIC MID-LATITUDES

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Sporadic-E phenomena are a powerful proxy for wave activity in the lower thermosphere. These waves are of three fundamental types, planetary waves, solar tidal forcing and gravity waves. Gravity waves have many different sources. Here observations at four different locations at mid-latitudes are used to try to determine how the relative importance of these types changes with latitude. The diurnal variation of Es occurrence over King George Island (62.2°S, 58.8°W), Argentine Islands (65.3°S; 64.3°W), Canberra (35.3°S; 149.0°E) and Hobart (42.9°S; 147.3°E) have been determined for autumn, winter, spring and summer during both low and high solar activity level. Occurrence has been computed for each Es-type, for the combined *c*- and *h*-type and for all types combined. The diurnal variations of the occurrence of each Es type at the four locations are compared, so as to identify the latitudinal and solar activity level dependencies of these variations. Seasonal means of foEs, fbEs, h'Es and fmin have been also computed for the four locations at both low and high solar activity level. The diurnal variations of these seasonal means show a remarkable similarity for all seasons and solar activity levels. Computed fbEs using known formulae are almost identical to the observed ones for all locations and seasons during both low and high solar activity. There is no clear evidence of some kind of longitudinal differences. This implies that solar tidal activity dominates the statistically occurrence, and that local effects e.g. gravity wave momentum fluxes are no of fundamental importance in controlling the occurrence of Es. It means also that it should be possible to predict the occurrence Es more accurately as the models of tides improve.