MULTI-INSTRUMENT OBSERVATIONS OF NIGHTGLOW INTENSITIES AND TEMPERATURES AND METEOR RADAR WINDS AND TEMPERATURES AT ADELAIDE, AUSTRALIA

IAIN M REID[1, 2], Jonathan M. Woithe[2], Daniel L. McIntosh[1] and Syed M.I. Azeem[3]

1. University of Adelaide, Adelaide, Australia}, iain.reid@adelaide.edu.au
2. ATRAD Pty Ltd, 1/26 Stirling St., Thebarton, Australia, jwoithe@atrad.com.au
3. Embry Riddle Aeronautical University, Dept Phys Sci, Daytona Beach, FL 32114 USA, azeem71d@erau.edu

More than one solar cycle of photometer measurements of *OH* and *OI* nightglow emission intensities have been made at the Buckland Park (*BP*) field site near Adelaide. The analysis of these data provides results consistent with previous ground based studies, and in very good agreement with simultaneous collocated measurements made with the Aerospace imager, which has been operated at the site since *2001,* and with global satellite climatologies of *OI* and OH intensities made with the *WINDII* instrument. Routine observations of *TOH* and *O2* rotational temperatures (*TO2*) began in *2001* at *BP* using a Czerny-Turner spectrometer from Embry Riddle Aeronautical University. The Aerospace Imager also has a temperature capability, and also provides routine meaurements of *OH* and *O2* rotational temperatures.
In this paper we describe the initial comparison between the results from the photometer, the spectrometer, the imager and the VHF meteor and MF radars operated at the site. Preliminary results indicate that nightglow intensities vary through the night, leading to a variation in the relative amplitudes of the various harmonic components when analyzed at different local times. This appears to be a result of a tidal modulation of the intensity through the night, and is consistent with *WINDII* satellite morphologies of the *OI* and *OH* global intensities. Both the *OH* and *OI* nightglow intensities show annual, semi-annual and quasi-biennial oscillations. There is evidence of a quasi-triennial oscillation in the emissions, which varies in amplitude through the night and through the year. The *QBO* in the *OH* intensity is consistent with the *QBO* in the *87 km MF* winds, while the *QBO* in the *OI* intensity is consistent with the *QBO* in the *95 km MF* winds. There is clear evidence of a solar cycle dependence of the *OH* and *OI* intensities, with nightglow intensity tracking the solar cycle with some hysteresis. A harmonic fit to this period yields an amplitude of about *17 ± 5 % (21 ± 15 %)* of the mean intensity.
These and other results will be discussed in this paper.

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I.M. Reid, Chemistry & Physics, University of Adelaide, Adelaide, 5005, Australia, iain.reid@adelaide.edu.au, tel: +61-8-8303-6301