Title: Buckland Park meteor detection radar winds

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1.0 Data Set Overview

Introduction

These data are a subset of observations made using the Buckland Park meteor wind radar that are of potential interest to DEEPWAVE investigators. They nominally cover the interval 1 May to 31 August 2014 although data gaps within that interval may be present.

The radar is located in South Australia at 34.6S, 138.5E.

2.0 Instrument description

The data were obtained using an ATRAD meteor detection wind radar system operating at a frequency of 55.0 MHz. Reflections of all-sky circularly polarized transmissions from meteor trails are detected using a 5-antenna Mills Cross array and their direction of arrival, range and drift velocity are determined.

This radar is operated by the University of Adelaide and ATRAD.

3.0 Data collection and processing

Hourly sets of meteor detections and radial velocities are used to determine the wind field above the radar. A best fit wind speed and direction is fitted to the radial velocity field for each hour of operation. Winds are determined for each hour through the observing interval and for each height from 70 to 100 km altitude at 2 km range intervals. These data include zonal and meridional velocities, and the number of meteors contributing to each wind determination.

Times are expressed in UTC and are included in year, month, day, hour, minute form and in 'Julian seconds': the number of seconds from 0:00 Jan 1 2000.

Plots of the wind field and the tides using a sliding 4-day fit to the wind data are included. Tidal fits only proceed if more than half the possible times and more than 75% of local times are available.

4.0 Data Format

Data have been stored in NetCDF files with station name, location and unit information included. Time series of the winds against a UT time base are stored.

Variable names are: year_ut_av, month_ut_av, day_ut_av hour_ut_av, minute_ut_av, jsec_ut_av, zonal_av, meridional_av, n_points.

5.0 Data Remarks

Data quality is optimal in the height ranges where the meteor count rate is highest (near the centre of the available height range) but acceptable at heights and times where a velocity has been provided.

Data are missing after Aug 8th 2014. Missing wind values are denoted by 999.0 or 1.e6.

6.0 References