

# **Diurnal variability of vertical velocity observed over a tropical station Gadanki (13.45°N 79.18°E) using VHF Radar**

**K.N.Uma**, T. Narayana Rao, and D. Narayana Rao

National Atmospheric Research Laboratory, Department of Space, Govt. of India, P.B.123, Tirupati 517502, email: knuma@narl.gov.in

Information of Vertical air motion is essential for better understanding of several mesoscale processes. For many purposes, this parameter has been retrieved through indirect methods using Radiosonde measurements and continuity equation. Since, these measurements are being made at standard timings (00 & 12 GMT) over worldwide, retrieval of vertical wind is possible only at those timings. Further, the vertical resolution of these measurements is poor compared to the variability of vertical wind. However, development of VHF Radar has revolutionized the studies of lower and middle atmosphere. The unique feature of this radar is its potential to measure vertical velocity with excellent temporal and spatial resolutions. In this paper, we examine diurnal variability of vertical wind motion over a tropical station, Gadanki (13.45°N 79.18°E) using VHF radar. Hourly winds are estimated from about 120 diurnal cycles (24hrs data) of MST radar data collected during 1995-2005. It is found that the vertical velocity is about a few cm/s in fair weather conditions and goes upto 10m/s and more during convection. The time series of vertical velocity plots show wave like structures, which are due to manifestation of short period gravity waves and tides. The variability of vertical winds is studied, quantitatively, using variance as a parameter. The vertical velocity has been averaged over each season viz., Premonsoon (March-May), Monsoon (June-September), Post monsoon (October-November), and Winter (December-February) to study the seasonal differences in diurnal variability. We present and discuss the results in detail in 36<sup>th</sup> COSPAR Scientific Assembly meeting.