THE PERFORMANCE OF SUPPORTING REMOTE SENSING INSTRUMENTATION DURING THE MAURITIUS RADIOSONDE INTERCOMPARISON

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ABSTRACT

During the "WMO Intercomparison of High Quality Radiosonde Systems" -- which took place from February 7 to 22, 2005 in Vacoas, Mauritius -- four remote sensing systems were deployed at the test site. This was done in a joint effort of WMO and the COST 720 Action "Integrated ground-based remote-sensing stations for atmospheric profiling." The aim was to test to which extent the co-location of in-situ (i.e., radiosonde) and remote sensing instrumentation could yield additional information about the state of the atmosphere. In addition, the high-quality profiles of pressure, temperature, humidity (PTU) and wind obtained in the radiosonde intercomparison could serve as reference for assessing the quality of profiles derived from remotely sensed data alone.

Four remote sensing systems were set up and operated by COST 720:

- A CT75 ceilometer. This instrument provided almost continuous information on clouds above the sounding station. Height resolution was 30 m, the maximum range about 11 km.
- A vertically pointing 78.2 GHz FMCW cloud radar. Although this instrument exhibited some technical problems, it provided useful data for the interpretation of some radiosonde profiles take in cloudiy conditions.
- A GPS receiver installed at the test site. Together with other stations in the International GPS Service (IGS) network, it allowed the determination of the integrated water vapor and, thus, the humidity field around the test site and its variation with time. This was achieved using standard software; then the comparison with the radiosonde humidity data was performed.
- The GeoForschungsZentrum Potsdam kindly supplied data from its CHAMP satellite for the area of Mauritius. This satellite observes occultating GPS satellites for deriving a refractivity profile. With some basic assumptions about the state of the atmosphere, PTU profiles can then be calculated.

In the presentation, some results of comparative analyses using radiosonde data and remote sensing information will be presented. In addition, the potential of integrating different systems for obtaining additional information and/or increasing the accuracy of the observed parameters will be discussed.