AMS Short Course on The Fundamentals of Doppler and Polarimetric Weather Radar, 14 January 2001, Albuquerque, New Mexico

An AMS short course on the fundamentals of Doppler and polarimetric weather radar, sponsored by AMS and organized by the AMS Committee on Measurements, will be held Sunday, 14 January 2001 preceding the 81st AMS Annual Meeting in Albuquerque, New Mexico.

This course reviews the principles of Doppler weather radar and its application to the observation of weather and the quantitative measurement of meteorological parameters. Extensive examples of weather phenomena are shown together with radar signatures. The latest advances in polarimetric Doppler weather radar technology are presented. The principals of clear air observation and fair weather phenomena will be discussed. This course is based on the textbook Doppler Radar and Weather Observations.

To understand the theory, operation, and applications of Doppler and polarimetric weather radar, focus is on meteorological phenomena, their radar signatures, and quantitative measurement of weather parameters.

Who should attend? Meteorologists, weather forecasters, physicists, engineers, and other professionals who need to understand applications of Doppler weather radar. Although there is no specific prerequisite for this course, participants should have an understanding of elementary physics and mathematics.

The following topics will be covered in the workshop.

1. **The principles of weather radar.** Historical background of radar development, electromagnetic waves, polarization, normal and anomalous propagation, pulsed Doppler radar, signals received from point and distributed scatterers, attenuation due to stormy and fair weather, backscatter and attenuation cross sections, hydrometeor size distributions, the radar equation, representations of echoes from moving and stationary scatterers, and radar limitations (e.g., range and velocity ambiguities).

2. **Weather signals.** Signal statistics, echo coherency, the weather radar equation, angular and range weighting functions, resolution volume, the reflectivity factor, and correlation of echoes in range and time.

3. **Doppler spectra of weather signals.** Discrete Fourier transform and window functions; Doppler spectra of weather echoes; relation between wind, reflectivity, and the Doppler spectrum; and examples of Doppler spectra associated with various weather phenomena (e.g., tornadoes).

4. **Weather signal processing.** Spectral moments; estimation of reflectivity using range and time averaging; auto covariance and spectral processing to estimate mean Doppler velocity and spectrum width; signal processing for coherent polarimetric radar; performance of the estimators; and examples of two-dimensional fields of reflectivity factors, radial velocity, and turbulence.

5. **Considerations in the observation of weather.** Spectrum width; wind shear and turbulence; antenna sidelobes; ground and sea clutter; techniques to extend unambiguous range and velocity; the effective width of a scanning beam; thunderstorm structure; wind estimation with two Doppler radars; and severe local storms, mesoscale convective systems, and hurricanes.

6. **Precipitation measurements.** Single parameter techniques (e.g., using reflectivity factor $Z$ or specific differential phase KDP) to estimate rain rate $R$; relations between $Z$, $R$, and liquid water content; accuracy of rain measurements; two parameter techniques to estimate rainfall; principles of radar polarimetry; and improvements of rain measurements and identification of hail with polarimetric radar.

7. **Observation of winds, storms, and related phenomena.** Visual depiction of storm phenomena (e.g., tornadoes, microbursts) and their radar signatures, wind field estimation using single Doppler radar, and weather hazards to aviation.

8. **Observations of fair weather.** Bragg scatter from irregularities in temperature and humidity; and ob-
servations of wind, buoyancy waves (i.e., undular bores, solitary waves, etc.), and turbulence in clear air.

9. WSR88D and TDWR applications. NEXRAD and TDWR specifications and applications, modes of operations, examples of displays and products, and automatic detection of hazardous weather.

For further information, contact the instructors, Dusan S. Zrnic (e-mail: zrnic@nssl.noaa.edu) or Richard J. Doviak (e-mail: Dick.Doviak@nssl.noaa.gov) at NOAA/NSSL and University of Oklahoma, Norman, Oklahoma.

AMS Short Course on Introduction to Meteorological Instrumentation and Observation Techniques, 14 January 2001, Albuquerque, New Mexico

The AMS Short Course on Introduction to Meteorological Instrumentation and Observation Techniques, sponsored by AMS and organized by the AMS Committee on Measurements, will be held Sunday, 14 January 2001 preceding the 81st AMS Annual Meeting in Albuquerque, New Mexico. This short course will also coincide with the 11th Symposium on Meteorological Observations and Instrumentation.

This one-day short course is designed for undergraduate and graduate students in response to the lack of an instrument curriculum in most university meteorology programs. Individuals (e.g., teachers, modelers, programmers, etc.) who have an interest in learning about instruments and observation techniques are welcome. The course will be valuable to individuals who would like an overview of basic measurement concepts. The focus of the course will be on basic in situ monitoring. Topics will include measurement of wind, temperature, humidity, pressure, short/long wave radiation, and precipitation. Basic data acquisition techniques will be included in the curriculum as well as siting requirements, quality assurance, and quality control procedures. Course participants will have the opportunity during the course to work with various sensors and data loggers.

A preliminary program, registration, hotel, and general information will be posted on the AMS Web site (http://www.ametsoc.org/AMS) in late September 2000. For further information, contact Jerry H. Crescenti, U. S. Dept. Commerce/NOAA, Air Resources Laboratory, 1750 Foote Drive, Idaho Falls, ID 83402; telephone: 208-526-2328; fax: 208-526-2549; e-mail: jerry.crescenti@noaa.gov.

AMS Short Course on Radar Calibration (RADCAL), 13–14 January 2001, Albuquerque, New Mexico

The AMS Committee on Radar Meteorology is planning to hold a two-day short course on radar calibration (RADCAL) from 13 to 14 January 2001, preceding the 81st AMS Annual Meeting in Albuquerque, New Mexico. The preliminary program, registration, hotel, and general information will be posted on the AMS Web site (http://www.ametsoc.org/AMS) in late September 2000.

It has been almost 30 years since there has been a workshop that covered this topic, and there has been much progress and many changes in the field of weather radar. Some of the progress in calibration techniques have fallen into ideology and some into myth, while others have been adopted into practice. There are also many new parameters that are now estimated, such as Doppler, various polarization parameters, and the refractivity $N$ field. They are also measured with a variety of sensor platforms, including conventional and Doppler radars, wind profilers, and bistatic systems from the ground, from satellites, and from ships. There has been progress in the calibration instrumentation and in comparative measurements for surface rainfall and snowfall measurements.

Program topics are being developed and speakers are being invited to give presentations. As details become available, they will be published in the Bulletin. For further information or suggestions contact Paul Joe, Meteorological Service of Canada; telephone: 416-739-4884; fax: 416-739-4211; e-mail: paul.joe@ec.gc.ca.
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