ERAD 2018 Short Course on Differential Reflectivity Calibration, 1 July 2018, Hotel de Reehorst, Ede HH

Lecturers:

- Dr. John C Hubbert, NCAR/EOL, Boulder CO
- Dr. Mike Dixon, NCAR, EOL, Boulder CO
- Mr. Richard Ice, Senior Systems Engineer with Centuria Corporation, supporting the WSR-88D Radar Operations Center, Norman OK
- Dr. Michael Frech, DWD (German Weather Service), Hohenpeissenberg, DE
- Dr. Asko Huuskonen, Finnish Meteorological Institute

Even though the quantity Zdr was first introduced to the radar meteorology community more than 40 years ago by Seliga and Bringi, the calibration of Zdr continues to be a topic of research, an issue for most radars, and a quantity whose temporal stability is poorly documented and inadequately understood. Gathering data in light rain is perhaps the most accepted technique for Zdr calibration. However, such precipitation events can be uncommon for a radar site and most operational radars have a mission to document the weather and not execute calibration scans thus making detailed calibration studies difficult.

Estimates of Zdr bias can be made by several techniques: 1) vertical pointing data, 2) engineering calibration, 3) crosspolar power technique, and 4) using external targets such precipitation, Bragg scatter and the sun. This short course describes the details of these methods and applies them to data from the National Center for Atmospheric Research (NCAR) S-Pol radar, the US National NEXRAD S-band, German National C-band and Finnish Meteorological Institute C-band radar networks to illustrate the concepts. S-Pol data is used to document the drift of the Zdr bias from fine time resolution measurements (less than 10 minute intervals) over extended periods of time (hours and days). The gathered data allows for an identification of the radar components that cause the Zdr bias to drift. An important aspect covered is the Zdr bias drift cause by temperature change of the antenna.

Calibration and data quality experts give presentations about their experiences with NEXRAD, the DWD (German Weather Service) radars and the Finnish Meteorological Institute. Zdr calibration techniques are described, illustrated with data and discussed.

The goal of the course is to educate the student as to the methods, principles, issues, and signal processing techniques required for accurately estimating Zdr bias and its uncertainty. The course is aimed at students, engineers and scientists who desire to know the details of Zdr calibration and how to apply the techniques to their radars and data.

The course consists of presentations by five radar calibration experts. Power points will be made available to the students. Solar calibration scans are discussed in detail.

For more information please contact John Hubbert, email: hubbert@ucar.edu, tel: +1 303 319 6228.