Title of the course:

A Modern Ground Clutter Mitigation Solution

Duration: Half Day

Availability to have on-line attendees: Yes.

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Abstract:

Recently the viability and practicality of regression based clutter filtering has been demonstrated. It is based on a low order polynomial fit to the time series to model the clutter signal. The polynomial fit is subtracted from the time series leaving the remaining weather signal. The main advantage of the regression filtering is that it does not requires the use of an attenuating window function as do the widely used spectral based clutter filters. The window function increases the error of the radar variable estimates. An operational regression based clutter filter includes 1) a robust, low error polynomial fit routine, 2) an algorithm to specify the required polynomial order, 3) an interpolation routine across the zero velocity gap created by the filter in order to reduce the bias of the reflectivity and velocity estimates and 3) real time clutter identification. An updated version of NCAR's Clutter Mitigation Decision (CMD), which is used across the NEXRAD network, is included in this short course.

Goals of the course:

1. understand the differences and features of both spectral based and regression filters.
2. learn all of the requirements for regression based clutter filtering.
3. to have the tools to implement the operational regression clutter filter including clutter identification.

Expected background of trainees:

Student should be familiar with radar time series, fourier transforms, spectral based clutter filters (e.g., GMAP), polynomial fits, filtering (e.g., moving average), Doppler spectrum, the bias and variance of radar variable estimates.
Hubbert et al, 2021: Using a Regression Ground Clutter Filter to Improve Weather Radar Signal Statistics: Theory and Simulations, JTECH.