7.5 DopplerCast™: A New Era in Storm Prediction for Broadcast Meteorology

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ABSTRACT

The ability to accurately track past and predict future storm locations has been a very elusive task. The capability to provide accurate predictions of the movement and evolution of storms, whether severe or non-severe convection, flooding stratiform situations, hazardous winter conditions, or a combination thereof, has been the subject of study and various algorithms for several decades. Weather Decision Technologies (WDT) and Meteorlogix have partnered to bring the latest storm prediction technologies into the realm of broadcast meteorology. By significantly enhancing developments at the Massachusetts Institute of Technologies' Lincoln Laboratory (MIT/LL), WDT and Meteorlogix have created DopplerCast™ - a customized system that predicts the movement and future location of radar based convective, stratiform, and winter weather out to one hour in advance to a high degree of accuracy. The DopplerCast™ system ingests NEXRAD radar images from the Meteorlogix meteorological data server and/or the local television station weather radar. Using sophisticated cross-correlation techniques on up to an hour of past images, a forecast of radar echo movement out to one hour in the future at five minute increments is produced. This forecast is displayed in the StormCommander™ system developed by Meteorlogix, which allows for real-time, street-level display and data manipulation. DopplerCast™ produces a new one hour forecast at 5 minute increments each time a new radar scan is available.

A DopplerCast™ system has been developed specifically for broadcasters who currently use a Meteorlogix StormCommander and Metwork FileServer configuration. The system also allows for ingest and processing of a television station's local Enterprise Electronics Cooperation (EEC) radar if available. DopplerCast™ is configured to handle convective, stratiform, and winter precipitation events. A rain/snow/ice/mix configuration is used during winter time events to estimate areas where frozen precipitation will be moving into, and when it will be moving out of an area, in addition to when liquid precipitation will change to frozen, and frozen to liquid. A user friendly Graphical User Interface allows easy access to all radars and processing.

DopplerCast™ forecast accuracy is very high for a storm tracking application. Testing by MIT/LL across several cases for the FAA has shown overall scoring of a Probability of Detection (POD) of 95% at 30 minutes and 88% at 60 minutes. Critical Success Index (CSI) scores, which take into account misses and false alarms were 89% at 30 minutes and 82% at 60 minutes.

An expanded paper on DopplerCast™ will be available at this conference.

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