NEXRAD Dual Polarization Data for FAA Aviation Products

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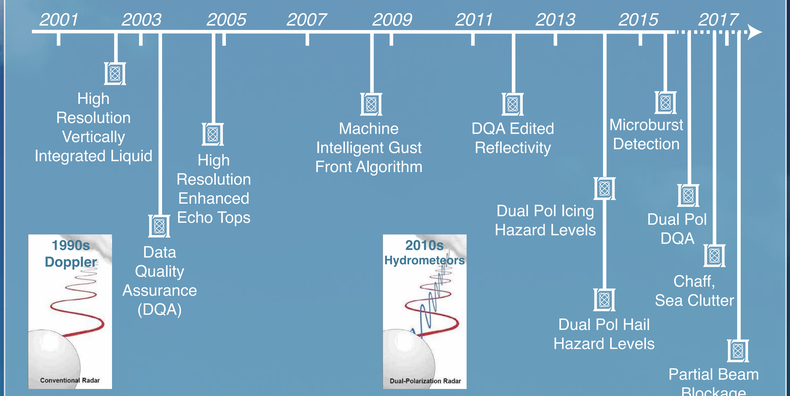
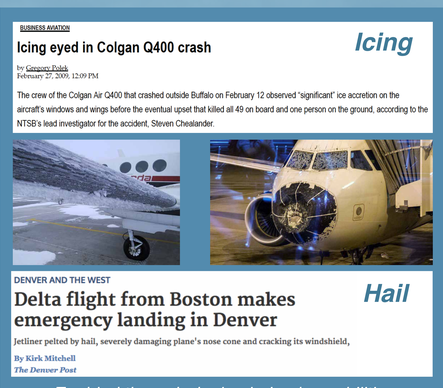
MIT Lincoln Laboratory Tech Transfer



- Federal Aviation Administration (FAA) Next-Generation Radar (NEXRAD) Program Office has been funding Lincoln Laboratory's NEXRAD Algorithm Enhancements Program since 2001
- Eight algorithms developed with seven fielded operational products
- 35+ algorithm enhancements as NEXRAD evolves

Convective Weather

Wind Shear

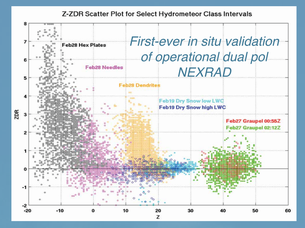


Enabled through dual polarized capabilities

Aviation Weather Hazard Detection Enabled by NEXRAD

Algorithm Challenges Addressed

Validation and Verification



Relate in situ particle observations to radar data

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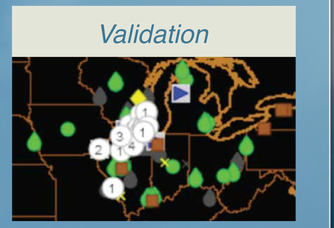
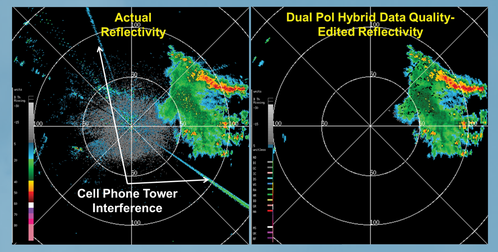


Rely on mPING and CoCoRaHS reports

- Develop and test new techniques from in situ observations to further icing detection by radar
- Validate/verify new techniques against past or future in situ measurements

Radar Calibration and Data Quality

First-ever sphere calibration of dual pol NEXRAD



Use dual pol data to identify non-weather contamination

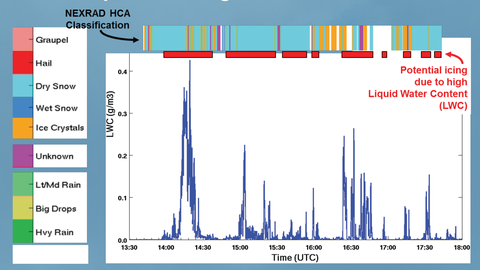
- Data quality remains paramount for automated FAA algorithms (no human-in-the-loop)
- Stable, calibrated dual pol data throughout the network will benefit the FAA algorithms

Targeted Future Benefits to Aviation Weather Algorithm Products

Icing Hazard

Use dual pol data and improved hydrometeor classification responding to particle type to estimate icing hazard

Expanded Icing Hazard Detection

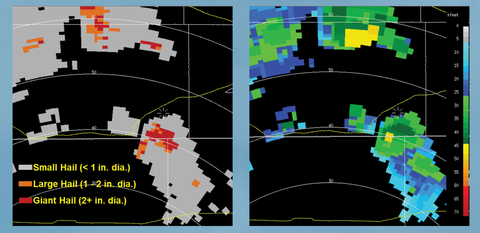


Reveal mixed phase subclasses

Hail Hazard

Use dual pol data and improved hydrometeor classification to provide area coverage of hail severity and altitude

Storm Intensity through Hail

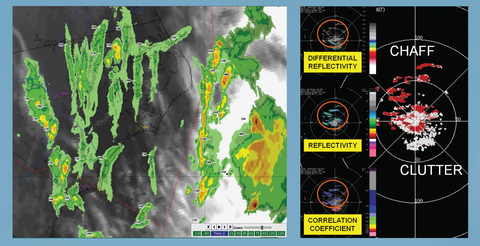


Max. hail size in column *Top hail altitude in column*

Data Quality

Use dual pol data and improved hydrometeor classification to improve data quality of aviation weather products

Augment Methods/ID Chaff



Chaff classification from dual pol needed

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