



Cayenne-2015 Data set status, NRC CV580 – Pilot Radar

Cuong Nguyen, Mengistu Wolde ⁽¹⁾
Alexei Korolev ⁽²⁾

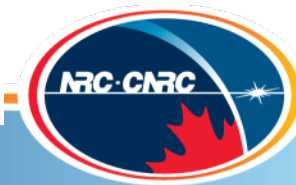
1 - National Research Council Canada
2 - Environment Canada

HAIC-HIWC Science Team Meeting, 9-12-November-2015



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Outline

❖ Basic Systems Info

- ❖ Rockwell Collins WX RTA -858 Receiver 622-8441-004
- ❖ Data is captured using Ballard Technology OmniBusBox
- ❖ Needs an operator to record the data
- ❖ Recorded for most of the flight segments when the aircraft was in cloud

❖ Data Status and Availability

❖ Sample Data

❖ Timeline – Processing and Analysis

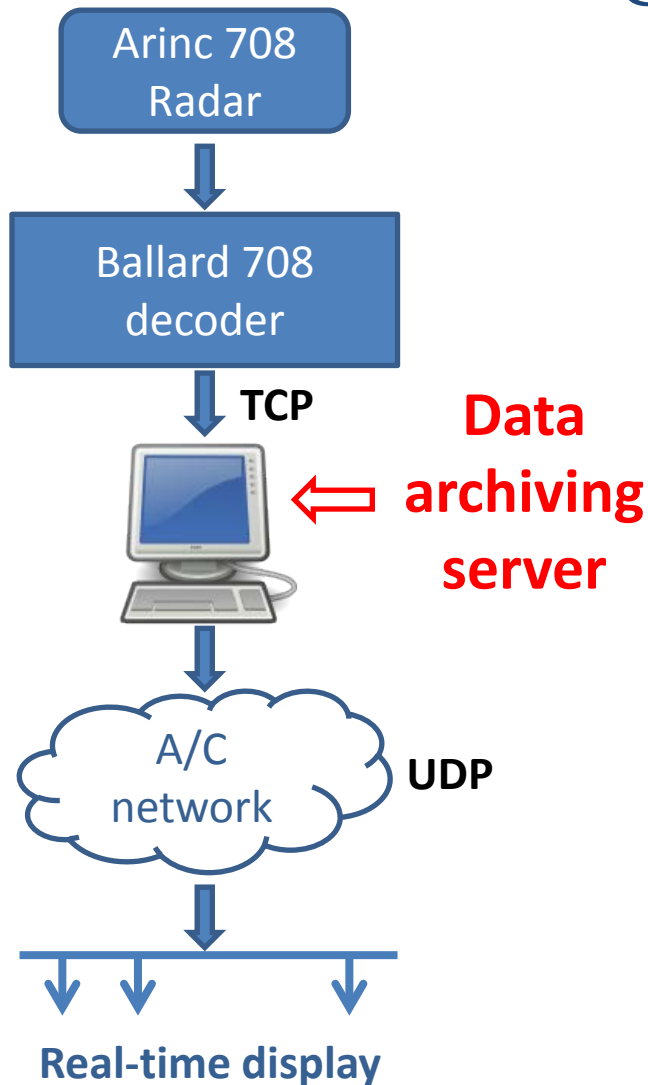


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Convair Pilot Radar and Data Archiving System



- ❖ Convair pilot radar binary data structure:
 - 64-bit floating double precision time stamps
 - 64-bit header containing operating mode, range, scan angle and other radar parameters
 - 512 packed three bit reflectivity values



Pilot Radar Data Status and Availability

Date May	10	12	14	15	16	16	20	23	23	25	26	26	27
Flt #	7	8	9	10	11	12	13	14	15	16	17	18	19
Pilot Radar													

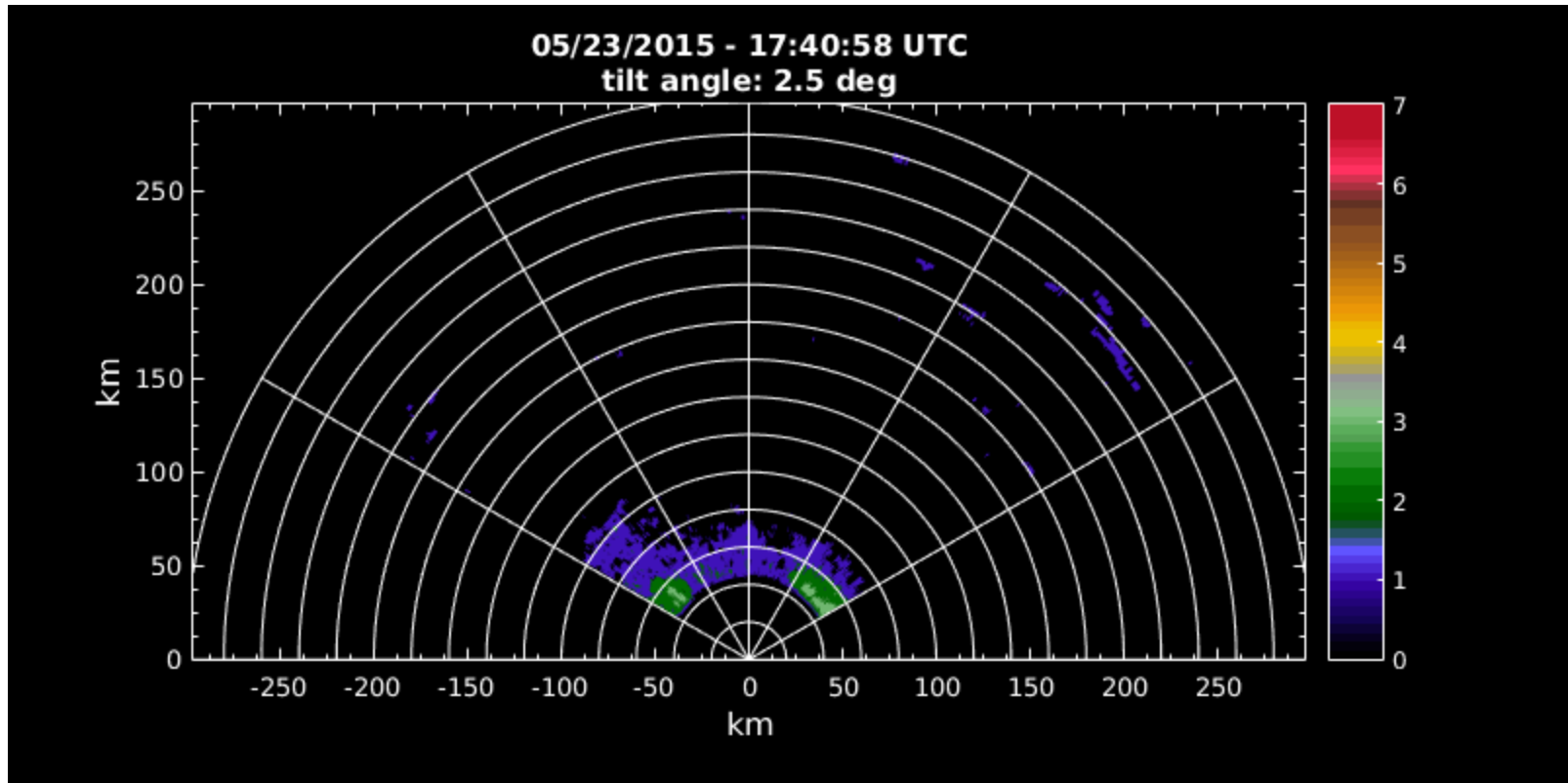


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Cayenne Pilot Radar Playback



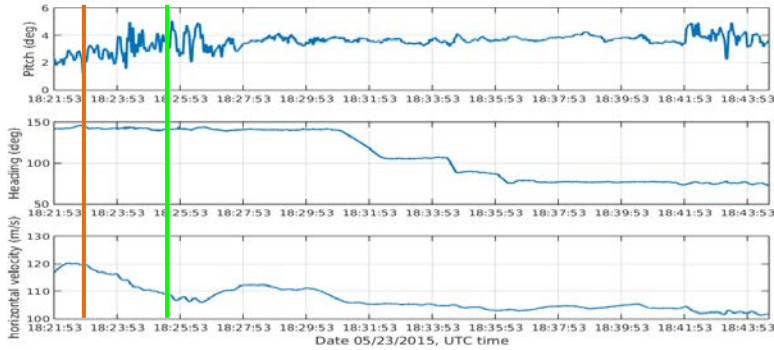
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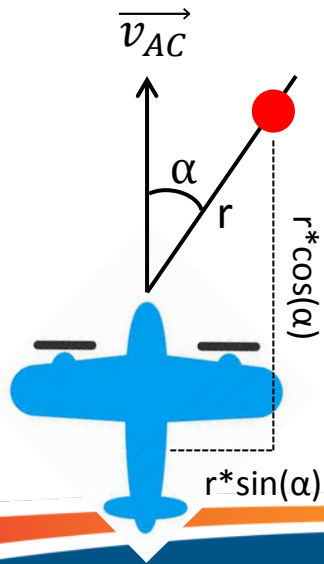
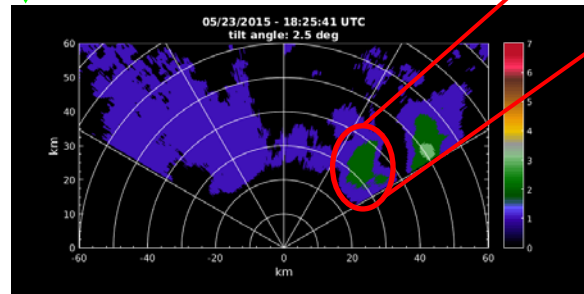
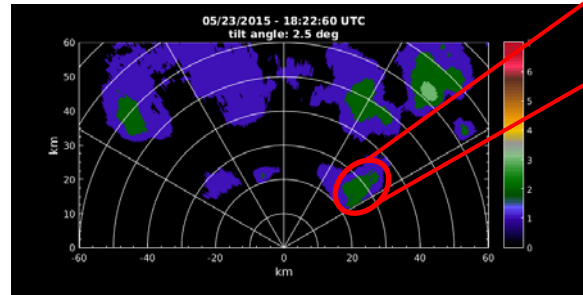
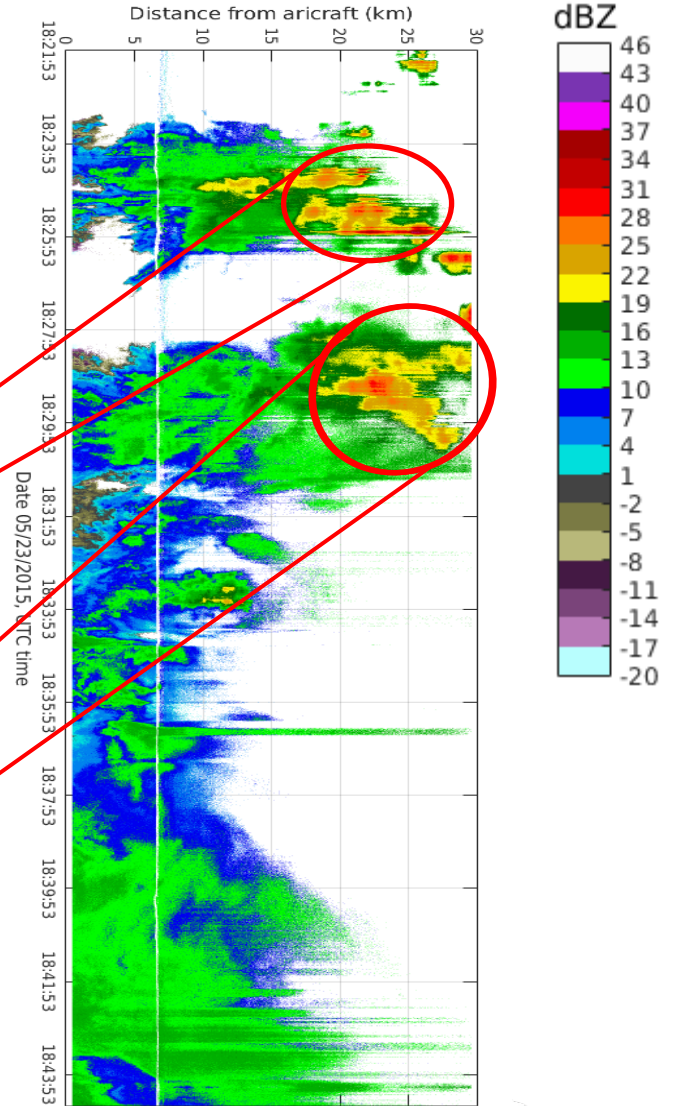


Coordinated with NAX side radar

Aircraft in-situ data



NAX
Z

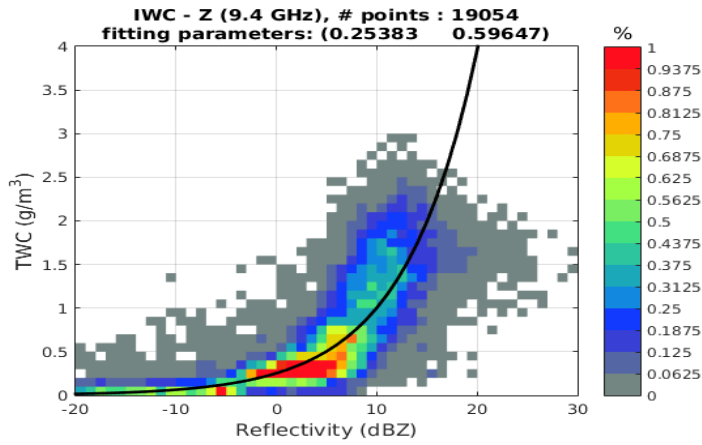


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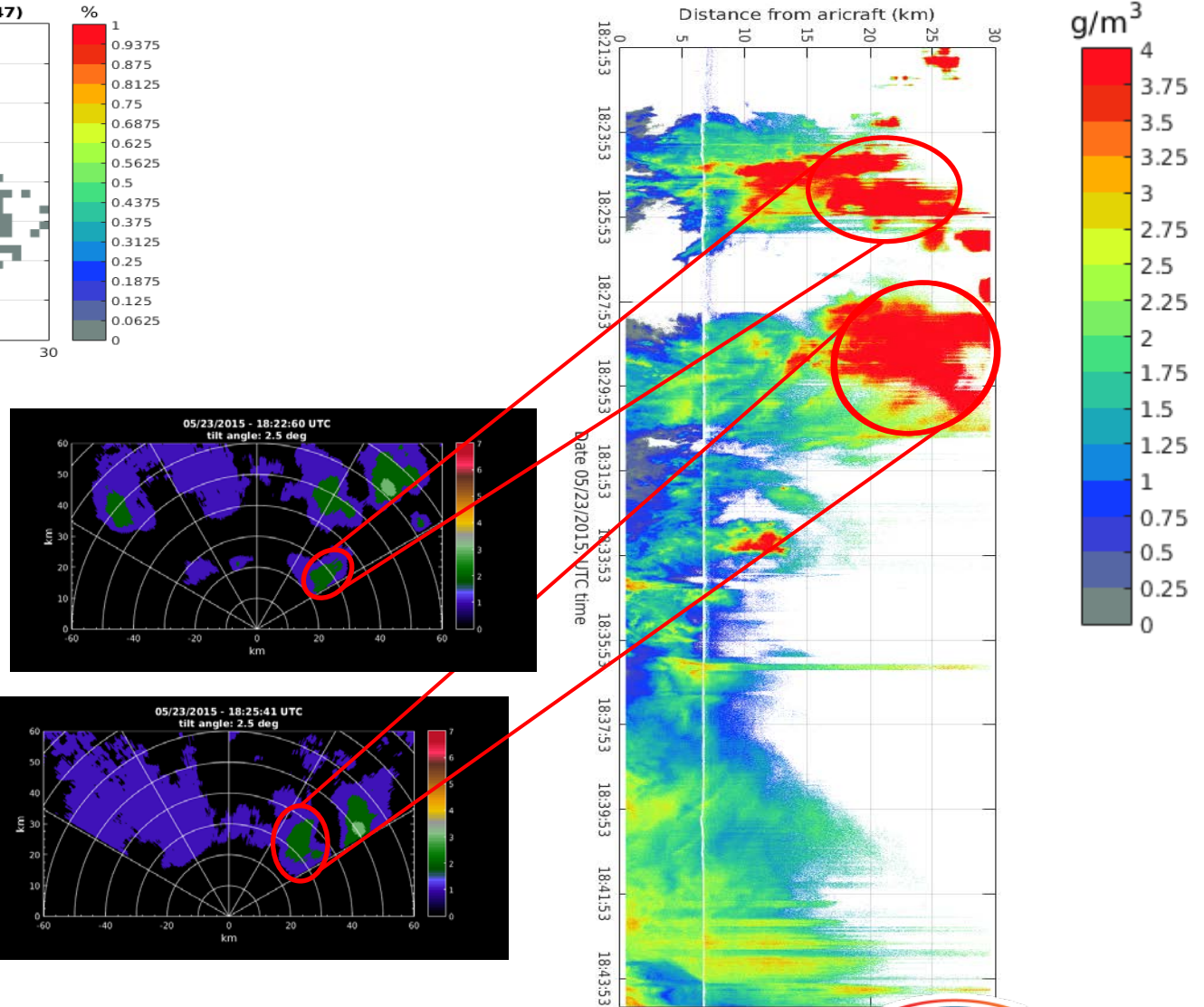
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IWC vs. NAX reflectivity



Estimated IWC from NAX reflectivity



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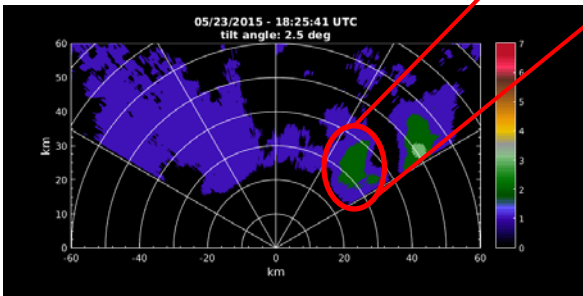
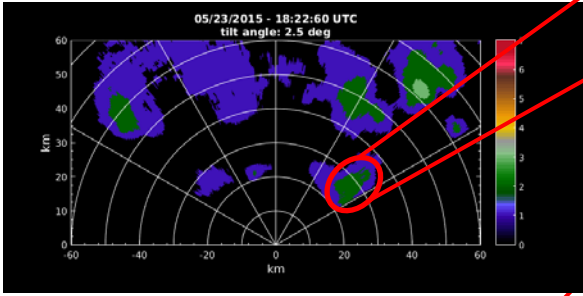
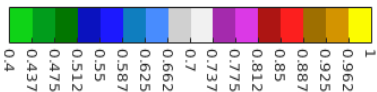
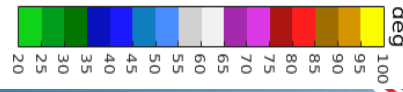
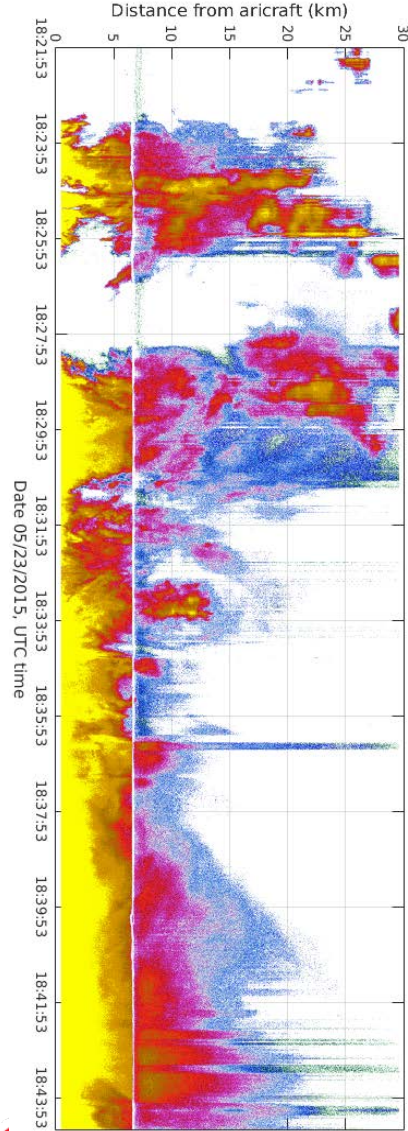
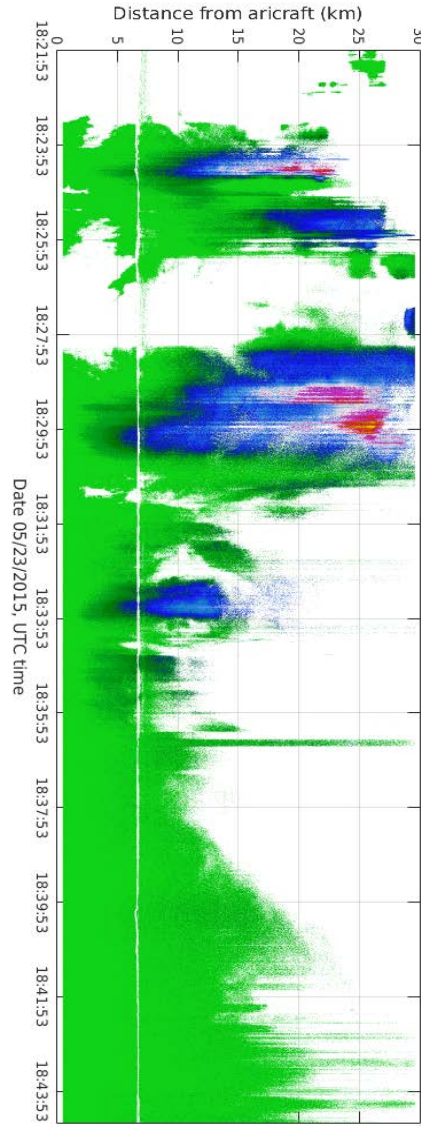
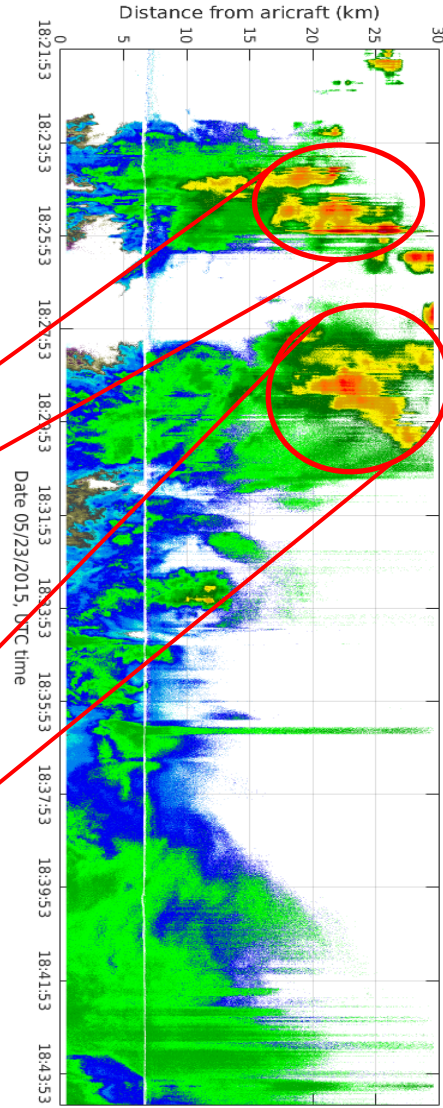


with NAX
dual-
polarization
signatures

NAX Z

NAX Φ_{dp}

NAX ρ_{HV}



Plan

- Pilot X vs. Research X – Convert Pilot X scale to Reflectivity
- Characterize the Pilot X performance in HIWC environment
- Pilot radar vs. microphysical properties



High Ice Water Content (HIWC) Program

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