High ice water content events – PREDICT

RAF pilots & science staff

PREDICT project

- *GV in St Croix, mid-August through September*
- *Cyclogenesis of tropical cyclones*
- *Primary GV mission = dropsonde platform; secondary mission = properties of cirrus clouds*
- *26 research flights, 9 showed high IWC events*

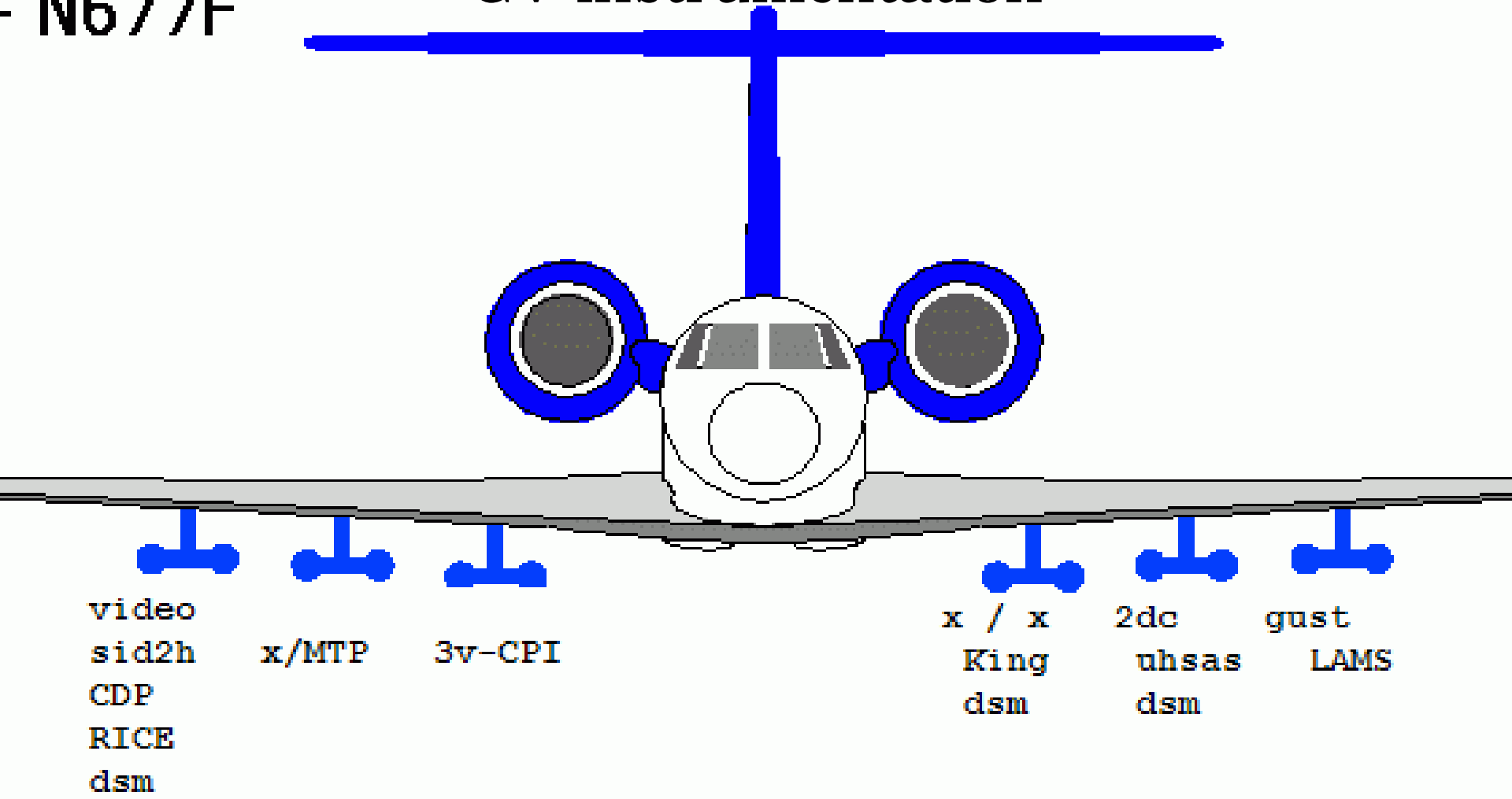
Outline

- *Show a typical flight profile & dropsonde pattern*
- *Flights avoid areas of likely strong convection*
- *Real-time"mission coordinator" display, satcom data relay*
- *high IWC events*
  - associated with highest/coldest/biggest IR cloud tops
  - occurred without warning
  - caused problems for some instruments: temperature, Mach, 2dc, MTP, radome data
  - maybe from static electric charge

NCAR

- N677F

GV instrumentation



Cabin: *dropsondes, CVI inlet, GISMOS, ozone, TDL hygro, aerosol*

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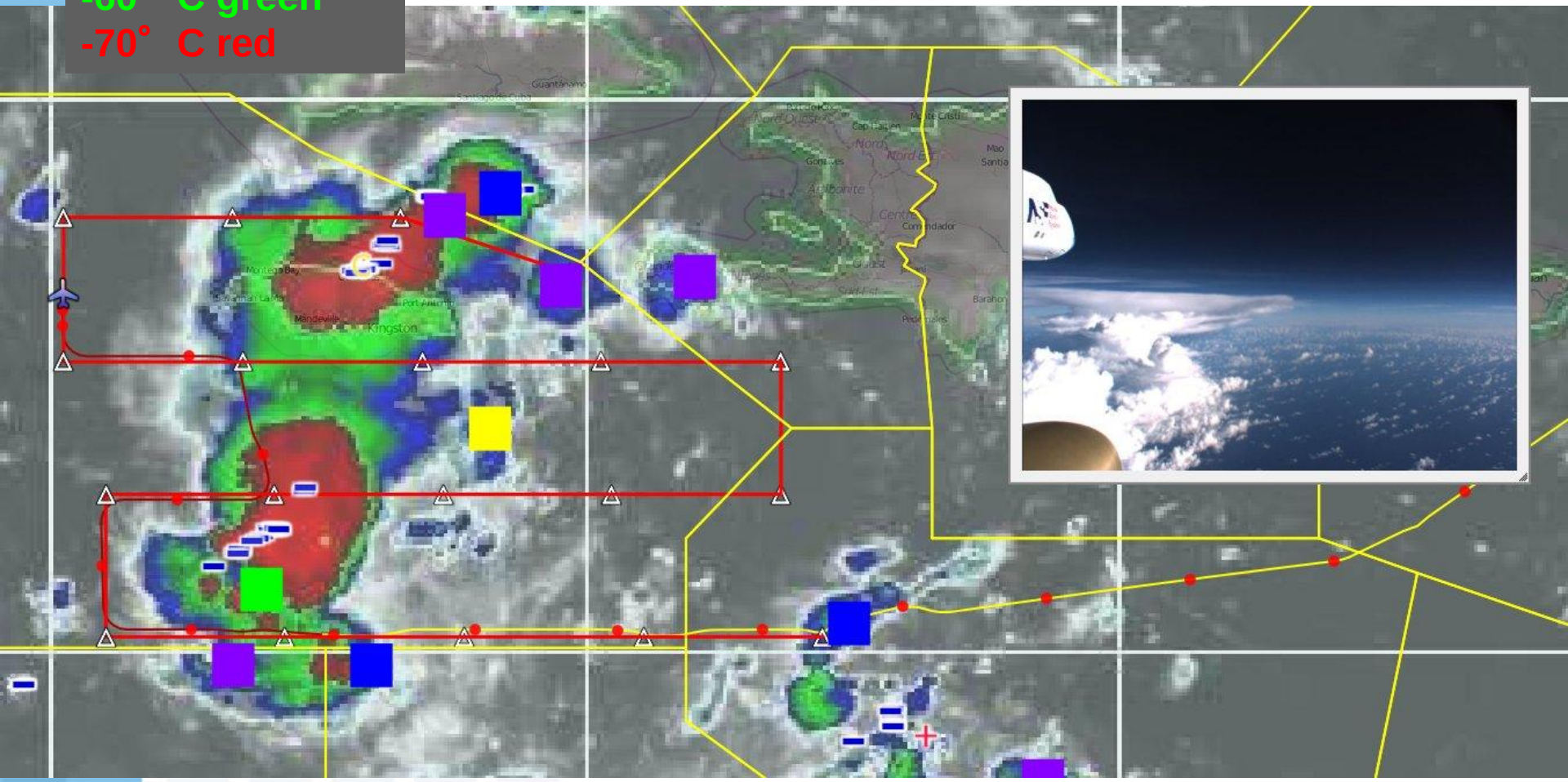
typical flight profile & dropsonde pattern, RF18$_4$ 12:42 z

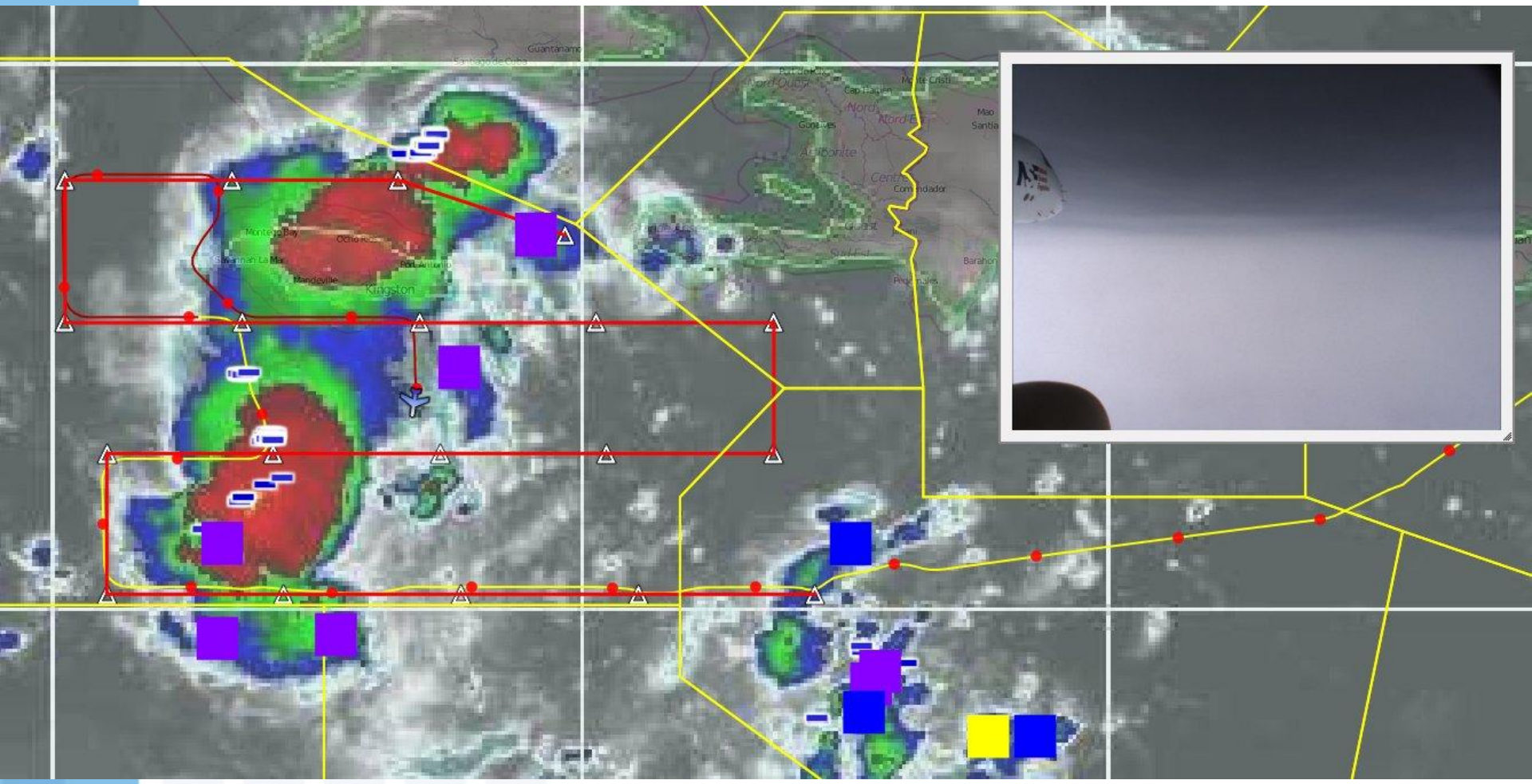
IR satellite image
-50° C blue
-60° C green
-70° C red



Note change of planned flight track due to deep cloud. next few slides show evolution of this flight. GV flight level is ~-60° C = green

NCAR

typical flight profile & dropsonde pattern, RF18 13:30 z



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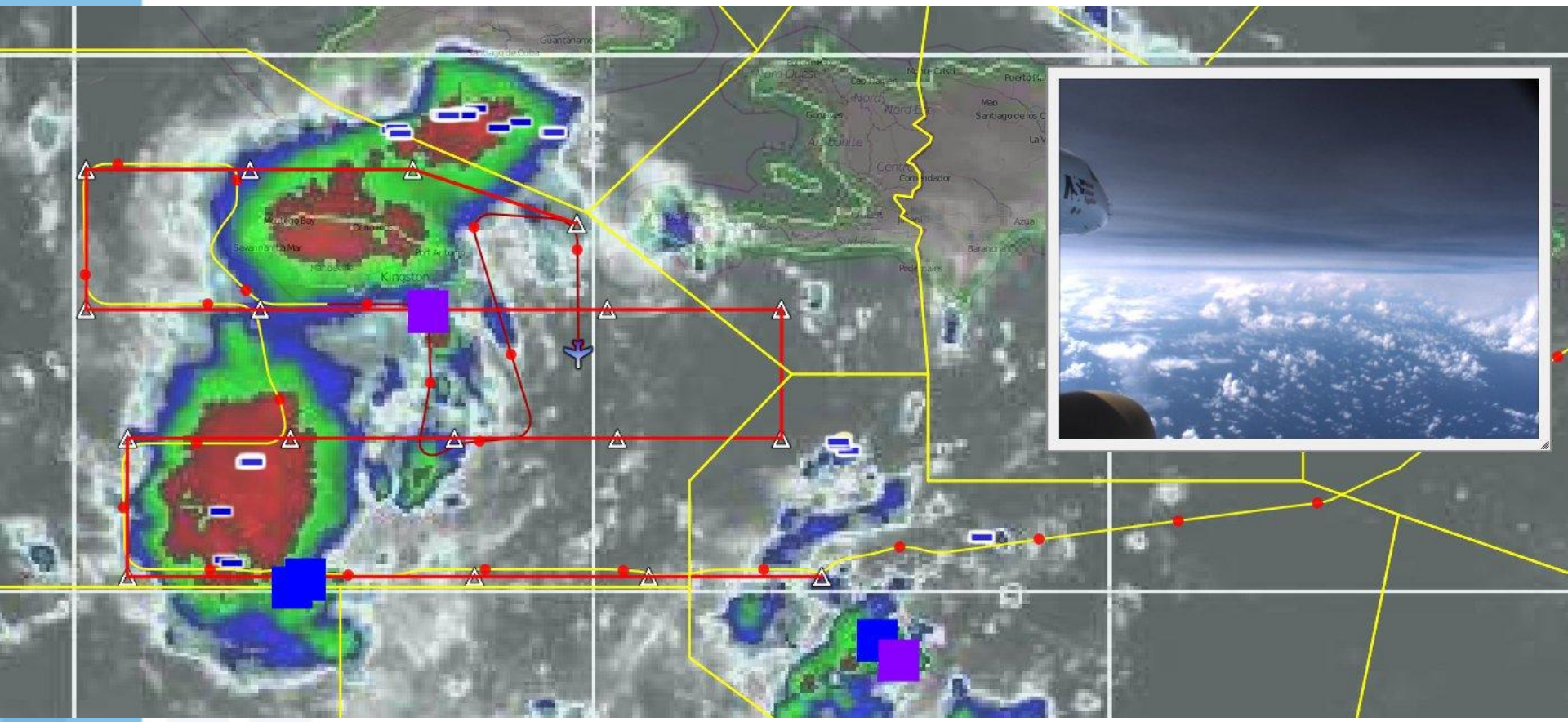
typical flight profile & dropsonde pattern, RF18 14:18 z



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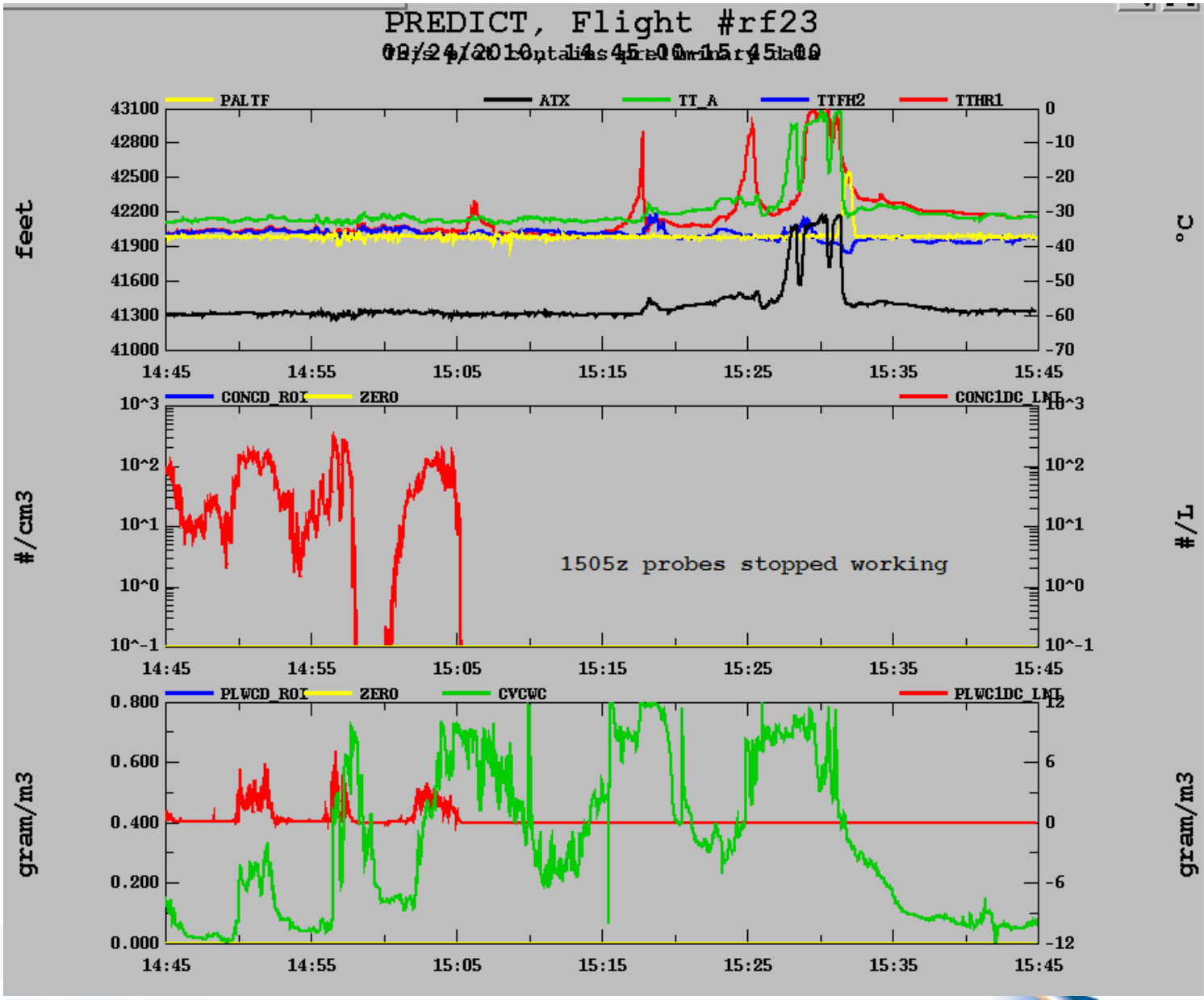
RF-23
high IWC
events

15:06
15:18
15:25
15:28-31



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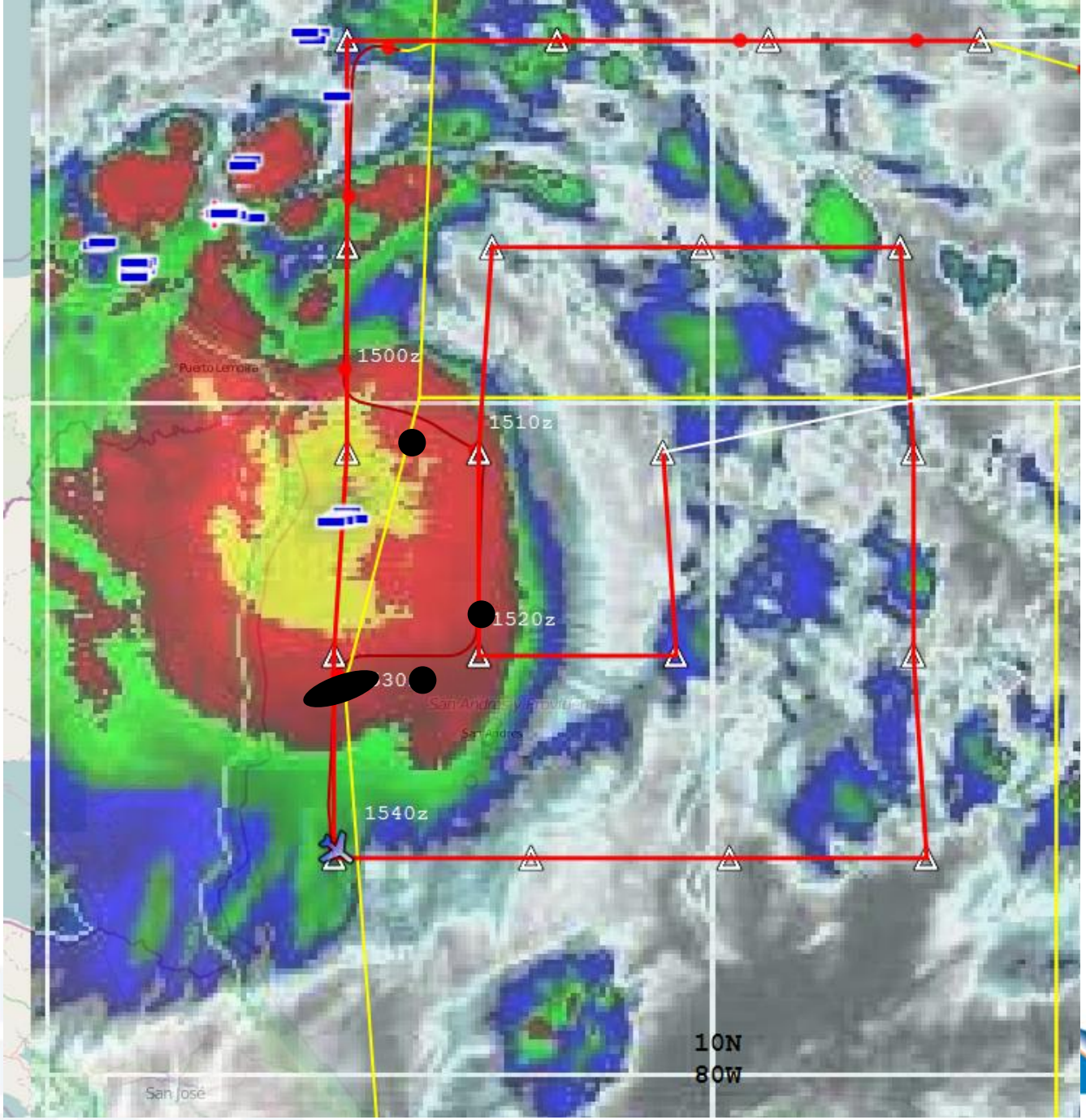
RF-23
high IWC
events

track deviates around coldest top



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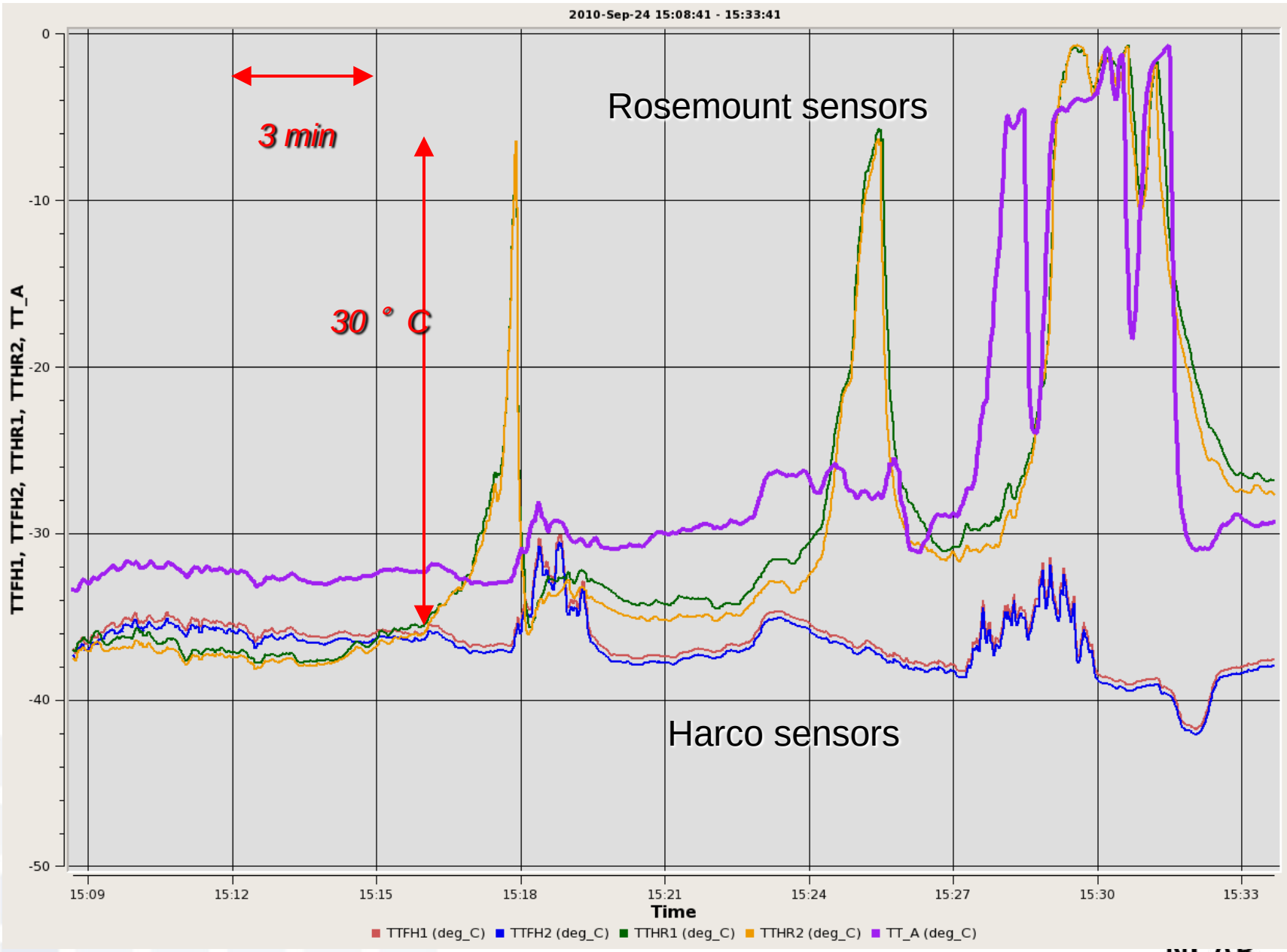
IWC affects on temperature measurements



Wx-avoidance radar

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Future

Continue to develop resources for real-time flight guidance

- *Lightning discharge maps (a/c & ground network)*
- *XM-radio weather, EFB (electronic flight bag) displays for pilots*
- *wx avoidance radar (add to MC display)*
- *Satellite imagery (via satcom)*
- *GV ← Internet relay chat → ops center*

Analyze data from all high IWC events

- *effects on temperature, Mach, research instruments*
- *2dc images (until it goes off-line)*
- *SPEC 3v-cpi (combo 2ds/cpi)*
- *Small Ice Detector (SID2H)*

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