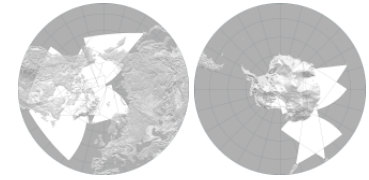


Software Status Report

R.J.Barnes



Radar Operating System



Digital Receiver Drivers:

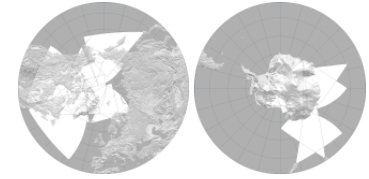
- **gc214if** **GC214 card at IF frequency**
- **gc214hf** **GC214 card at HF frequency**
- **gc214TSif** **GC214/TS card at IF frequency**
- **gc214TShf** **GC214/TS card at HF frequency**

(Lots of thanks to Todd and Dieter)

Drivers appear identical to the rest of the software so no customization for different radars



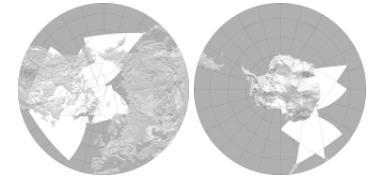
Radar Operating System



Status of Stereo:

- Stereo converted to the new version of ROS
- Implemented for analogue receiver
- Implemented for digital receivers
- Digital receiver driver adapted to allow multiple cards

The Stereo software has been installed and tested using digital receivers at Blackstone.



Implementation of “tauscan”

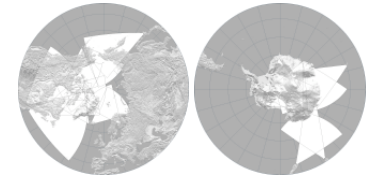
- **Ray and Kjellmar’s new pulse sequence and lag table**
 - Lag table has multiple pulse pairs for a single lag
 - Best pair are used for analysis
- **New analysis libraries and tools to support it**

Still to do:

- **Implement a stereo version**
- **Add a variables to the RawACF file to indicate we are using a “tauscan mode”**
 - **Currently store only the first set of lag pairs**
 - **Need to store the full lag table**
- **Modify make_fit to autodetect “tauscan” RawACF files and process them automatically**



Radar Operating System

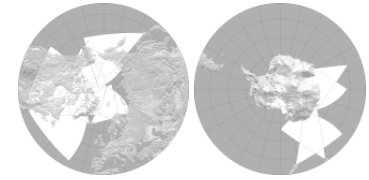


Storage of I&Q samples

- **Capability was developed to diagnose digital receiver card**
- **Developed xscope as a virtual oscilloscope**
- **Developed rawdump to look at actual sample numbers**
- **Both diagnostic tools**
 - run from the command line
 - produced a single monolithic file
 - did not contain all the radar operating parameters



Radar Operating System



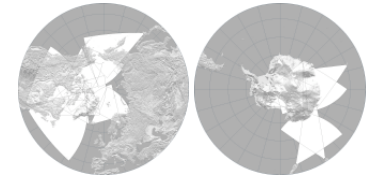
Storage of I&Q samples - iqwrite

- **Similar to rawacfwrite and fitacfwrite**
- **Stores files every 2 hours in DataMap format.**
- **File contains the Radar Parameter Block and I&Q samples.**
- **Samples are accumulated in a shared memory buffer maintained by the Control Program**
- **iqwrite can be turned on and off in the control program**

Files are big!



Analysis Software



Currently at version 2.12

- Numerous bug fixes
- Added tools for working with I&Q data:

`make_raw`

`make_rawex`

`make_iqinx`

`trim_iq`

`iq_plot`

make a RawACF file from I&Q data

make a RawACF file from I&Q data (tauscan)

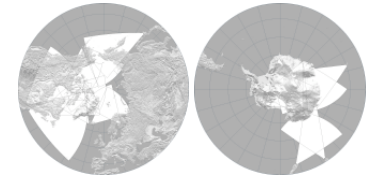
make an index file to an IQdat file

trim a section from an IQdat file

simple xterminal display of I&Q data

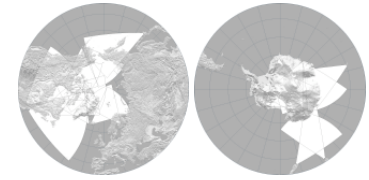


Analysis Software



The IDL libraries include routines for reading and writing I&Q samples from an lqdat file.

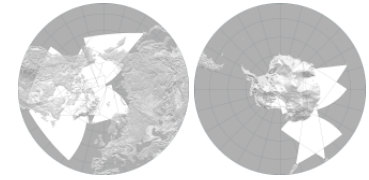
- **Example code is included**
- **An IDL implementation of the full ACF algorithm would be an excellent educational tool**
 - **Good project for a student**



Added support for multi-page documents

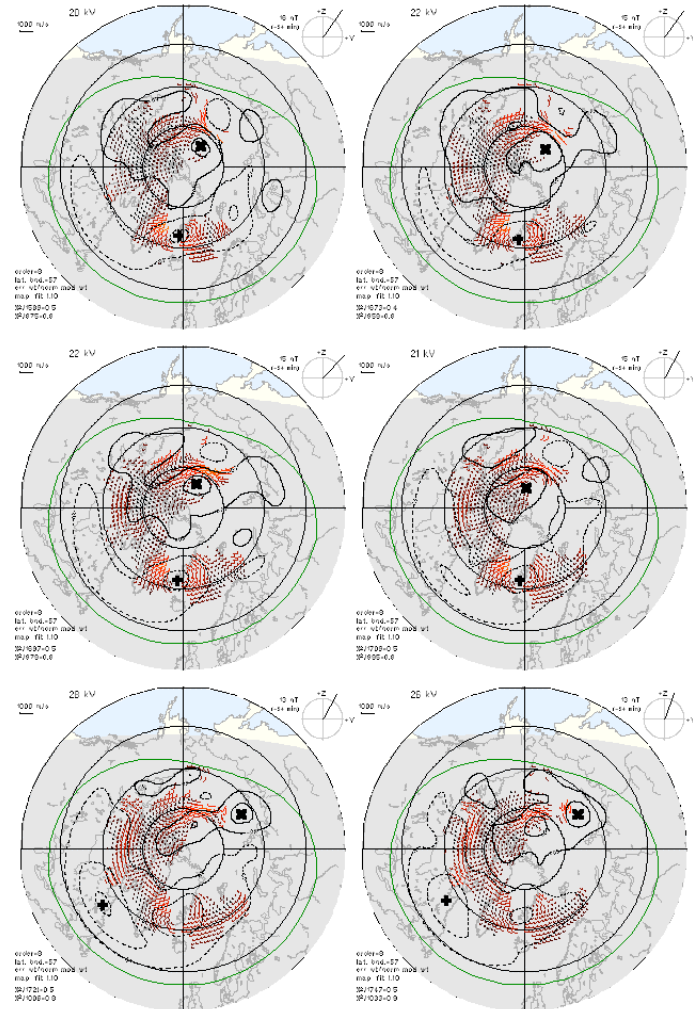
- **Previously tools could only produce a single plot**
 - difficult to review lots of data
- **New tools provided for working with multi-page documents**

<code>rplotcat</code>	concatenate multiple rplot files into one multi-page file
<code>rplotgrid</code>	reformat a multi-page rplot file into a multi-panel plot
<code>rplotindex</code>	generate an index to a multi page rplot
<code>rplotmultiplex</code>	construct a multi-page rplot file from multiple sources
<code>rplotpages</code>	count the number of pages in a multi-page rplot document
<code>rplottrim</code>	extract pages from a multi-page rplot document



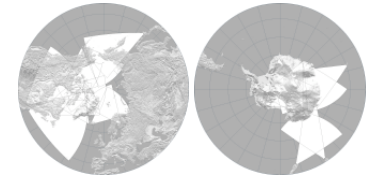
Generating a multi-panel plot:

```
rplotcat ????.rp.xml > multipage.rp.xml
rplotgrid -width 640 -height 960 \
  -numx 2 -numy 3 \
  multipage.rp.xml > output.rp.xml
```





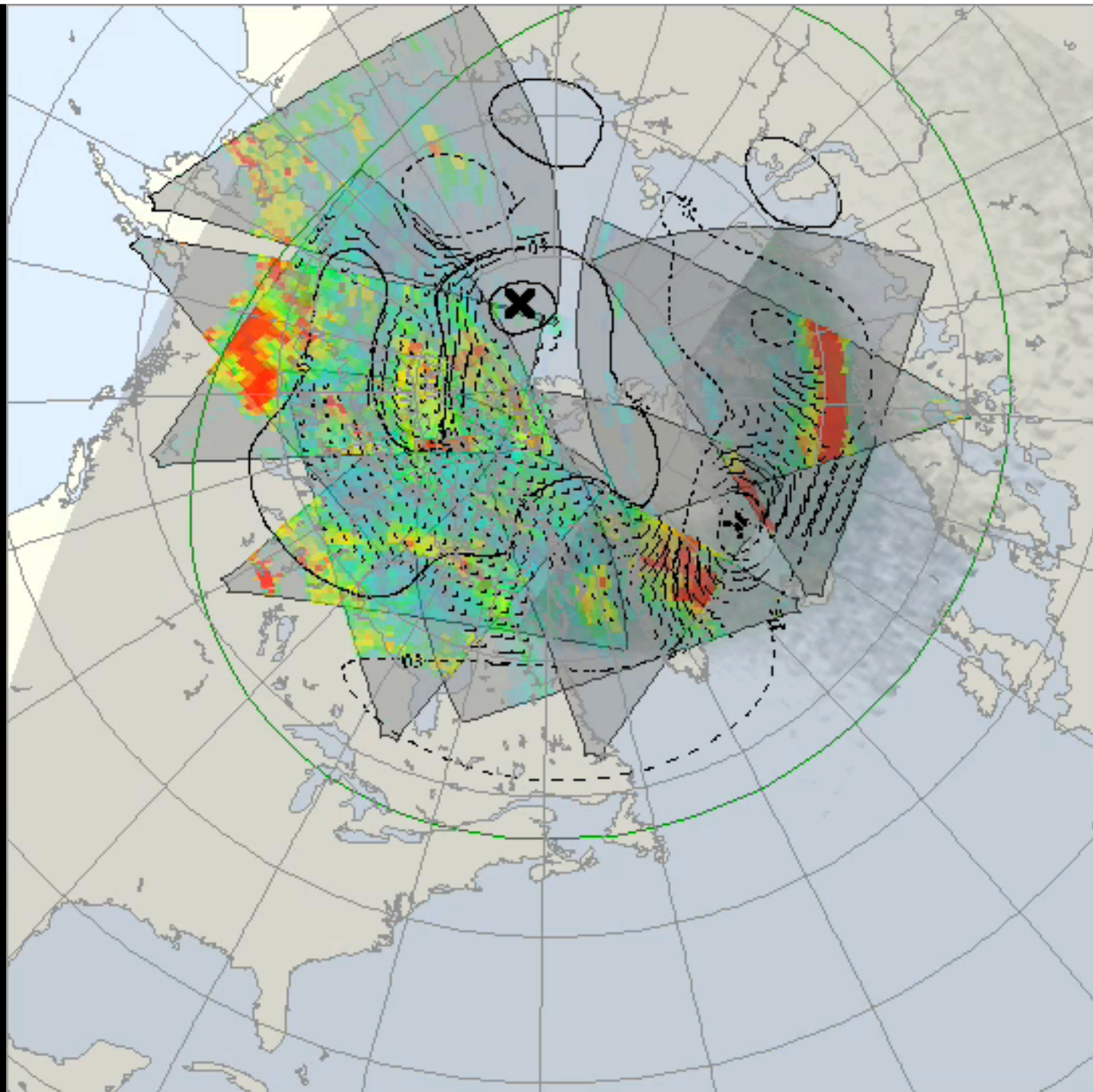
RST Graphics

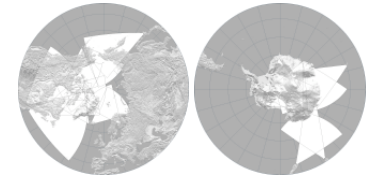


New compositing tools

- **Allows plots to be constructed from layers of data (like GIS)**
- **Multiple data sources (not just SuperDARN) can be composited together**
- **Full Alpha Channel blending (translucency)**

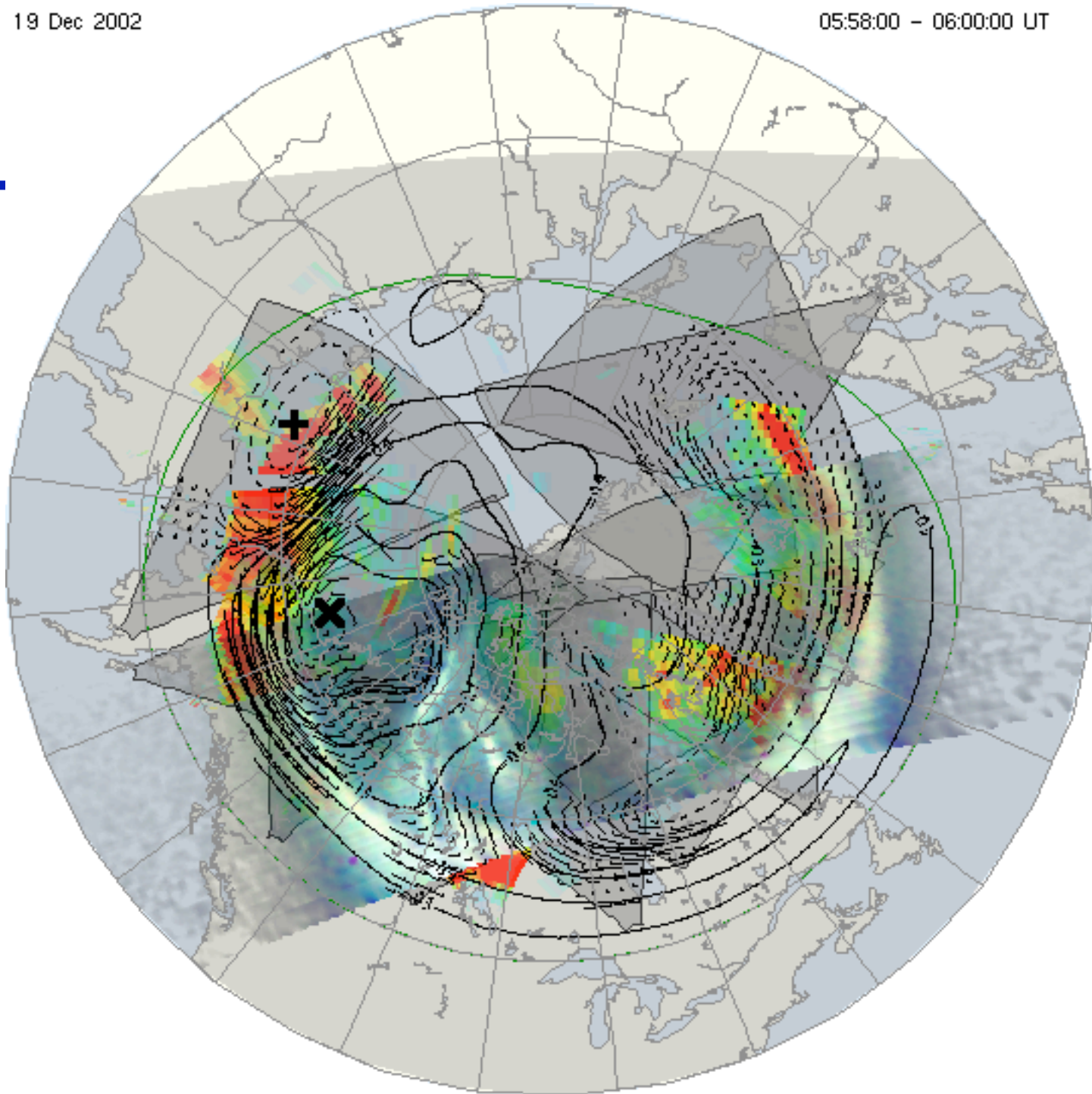
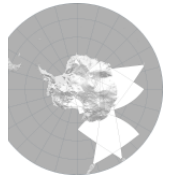
No other scientific visualization software can do this

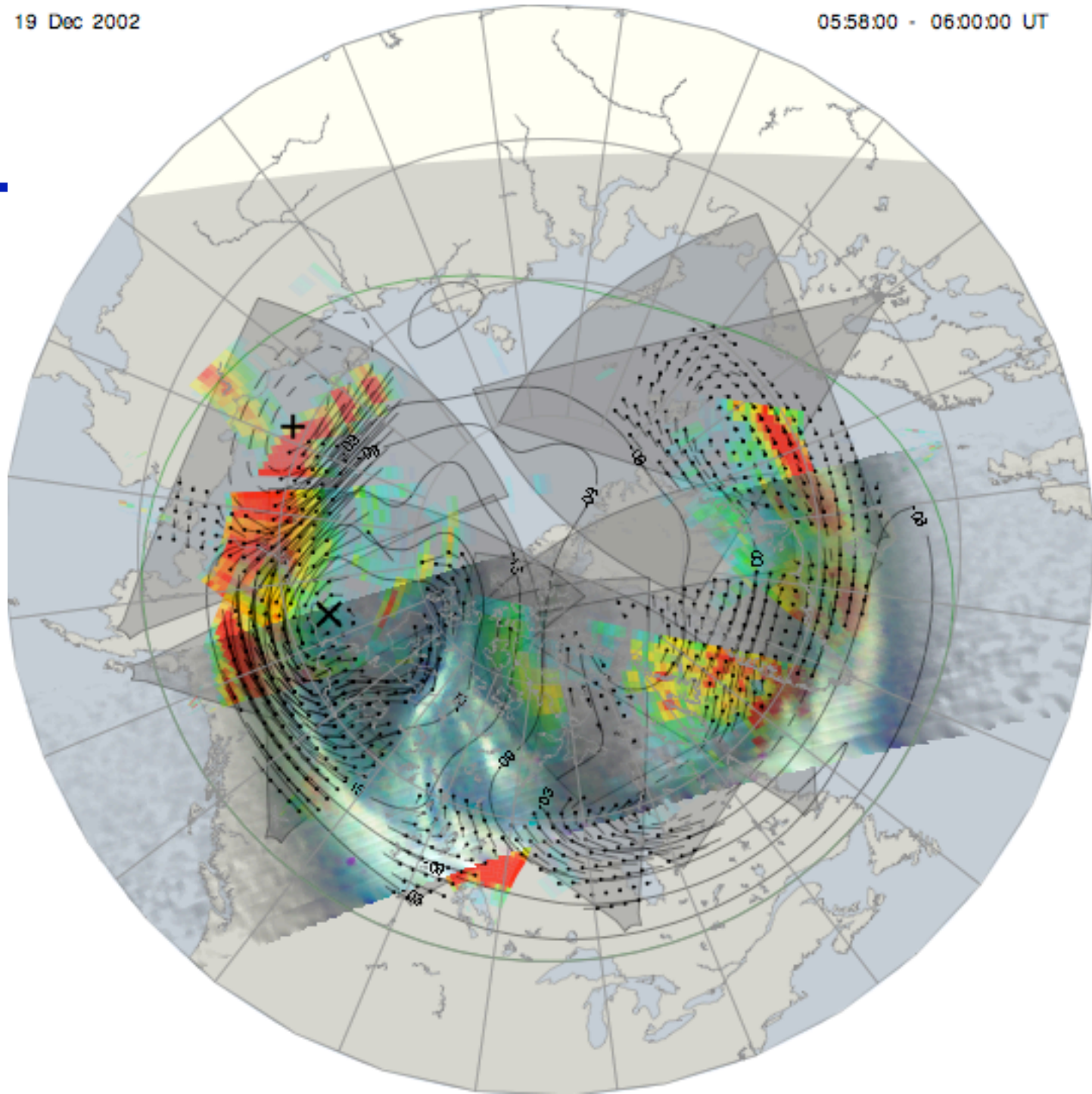




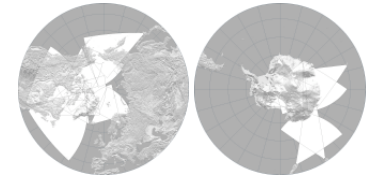
Scalable Vector Graphics (SVG) output

- The existing rplot output is SuperDARN specific
- SVG is a W3 standard
- Supported by many graphics editors
- Supported by many browsers





APL



One more thing.....