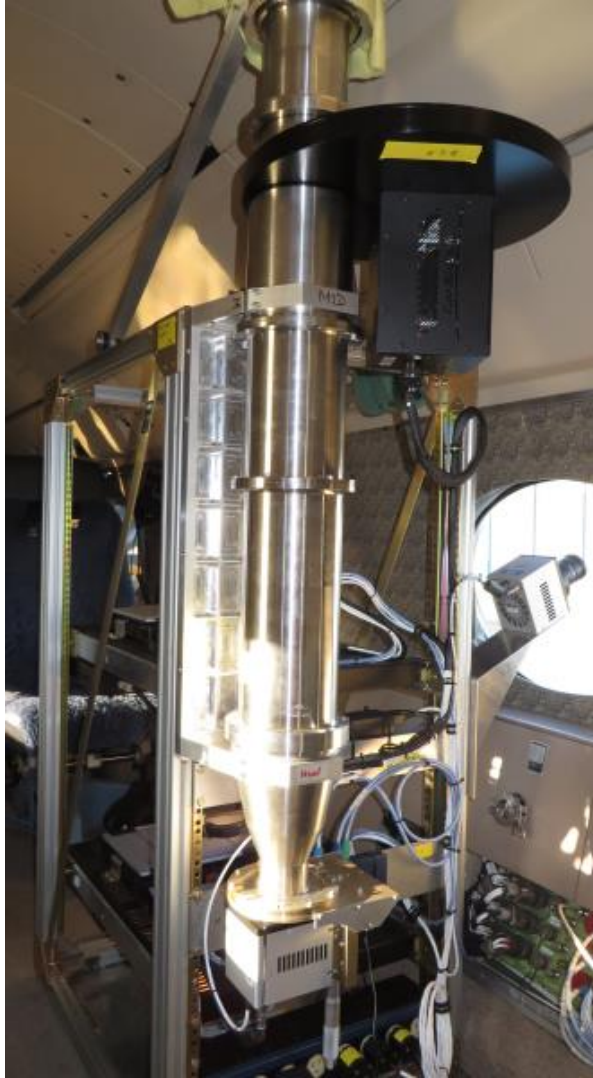


GV AMTM Data

P-D Pautet, MJ Taylor and Y Zhao
CASS, Utah State University, Logan UT

USU Instruments – GV

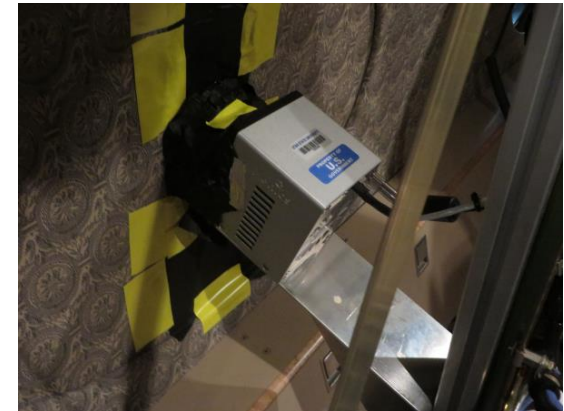


Advanced Mesospheric Temperature Mapper (AMTM):

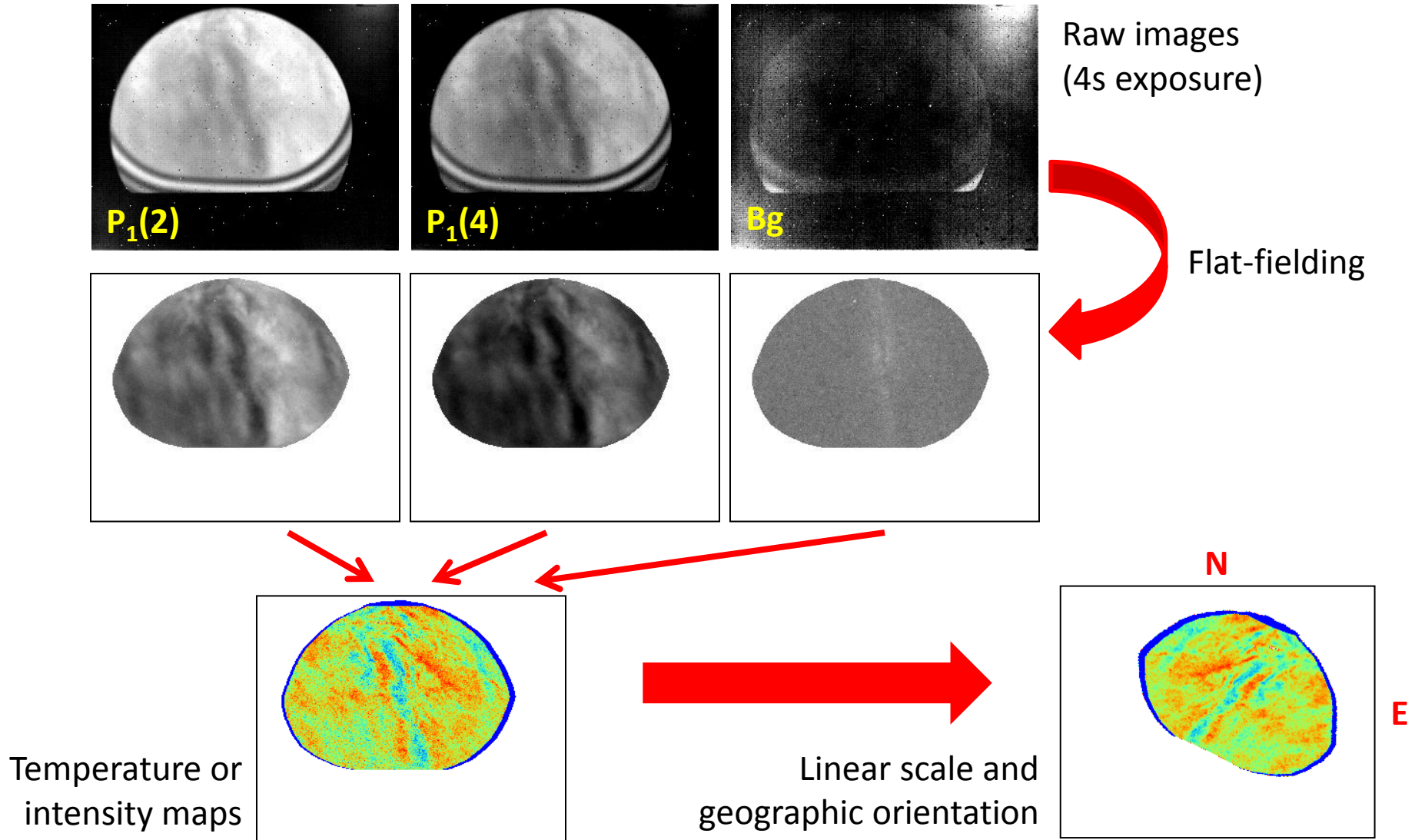
- 120x80km temperature and intensity maps of the OH layer (~87km), centered at the zenith, every ~16s

Two IR wide field-of-view side looking cameras:

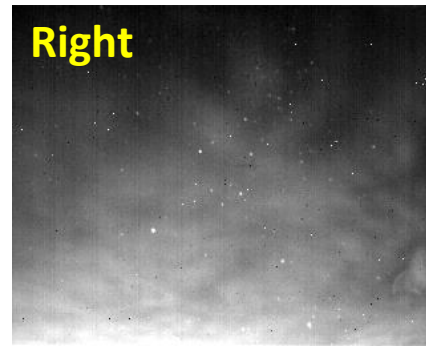
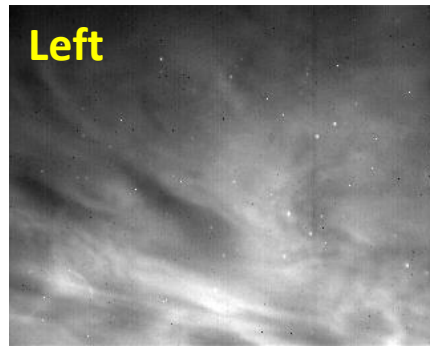
- OH brightness over a large region (up to 450km on each side of the GV), every 3-4s



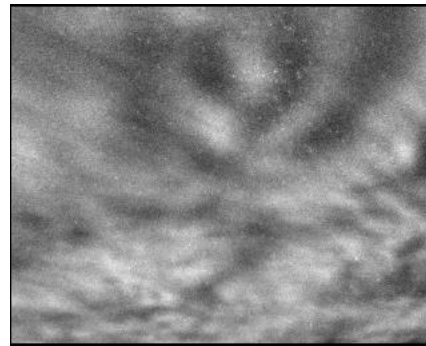
Temperature/Intensity Maps Processing



Data Processing – Wing Cameras



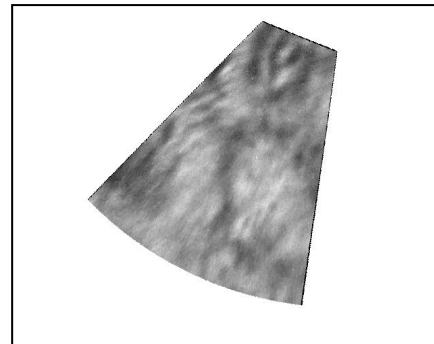
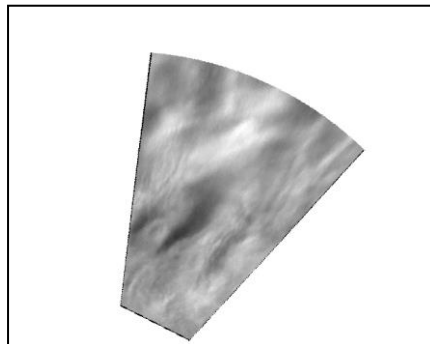
Raw images
(1.5-s exposure)



Removing
the stars and
flat-fielding

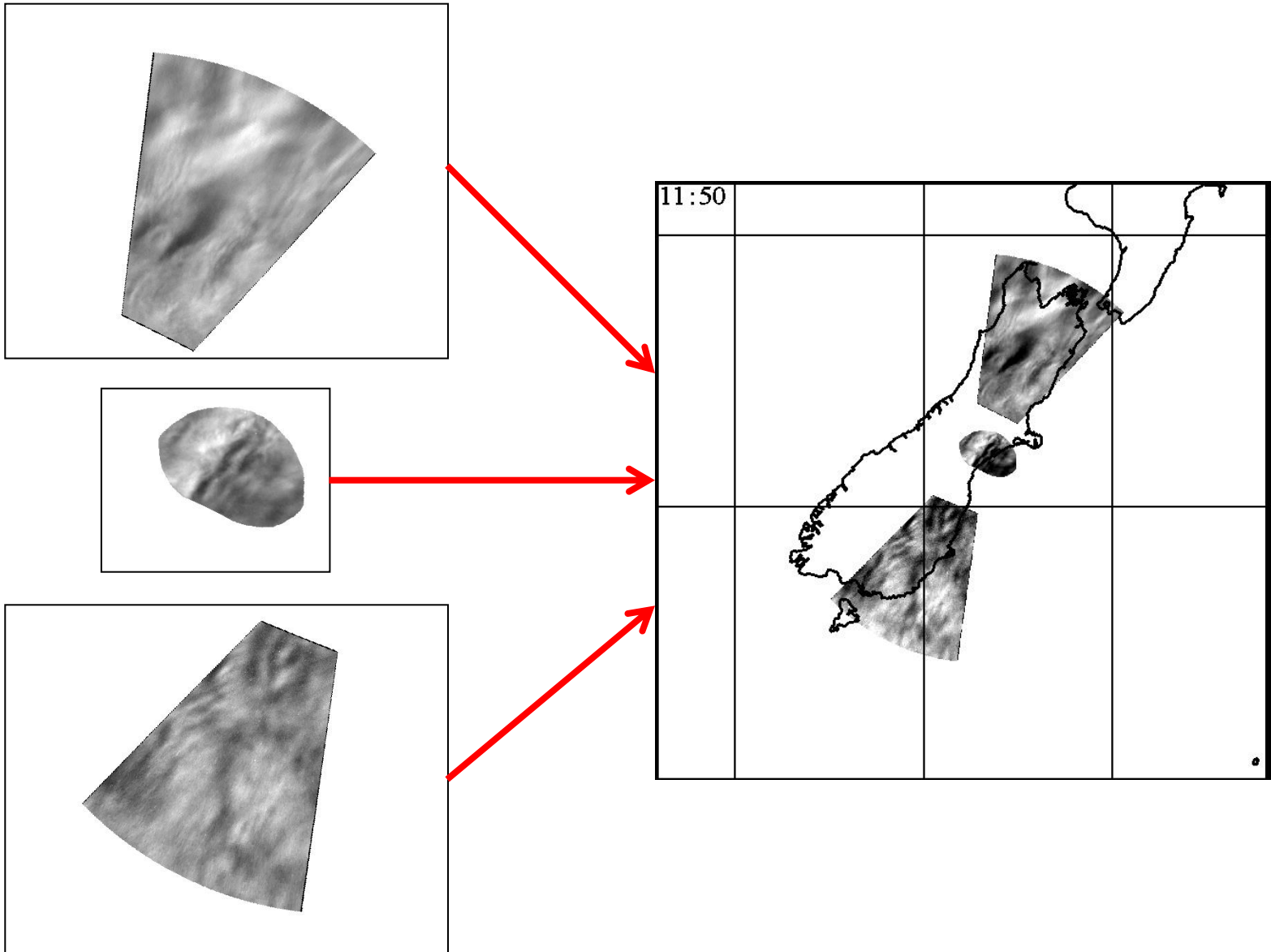


Projection

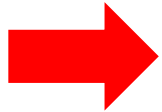


Linear scale and
geographic orientation

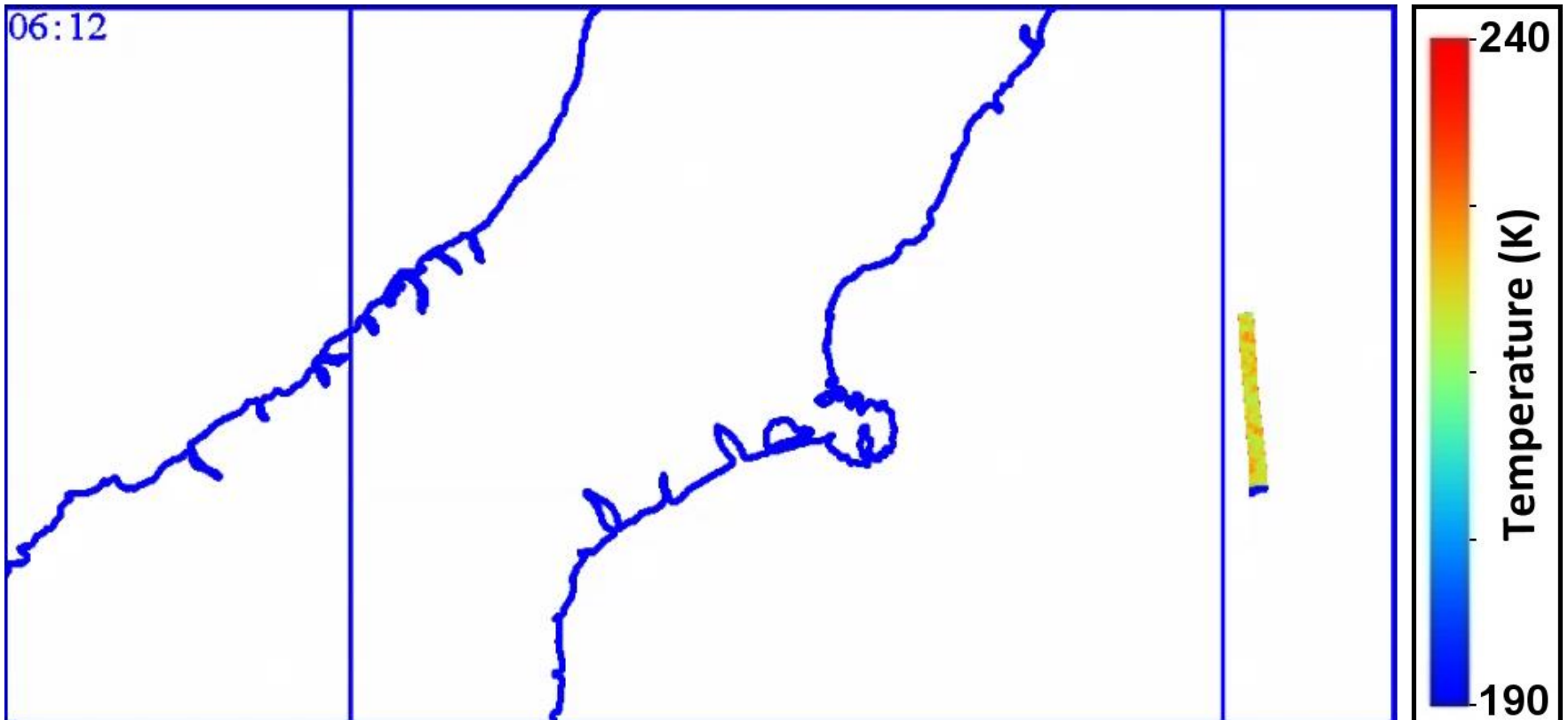
Projection on a Geographical Map



Keograms Representation



Collocating a slice from each image



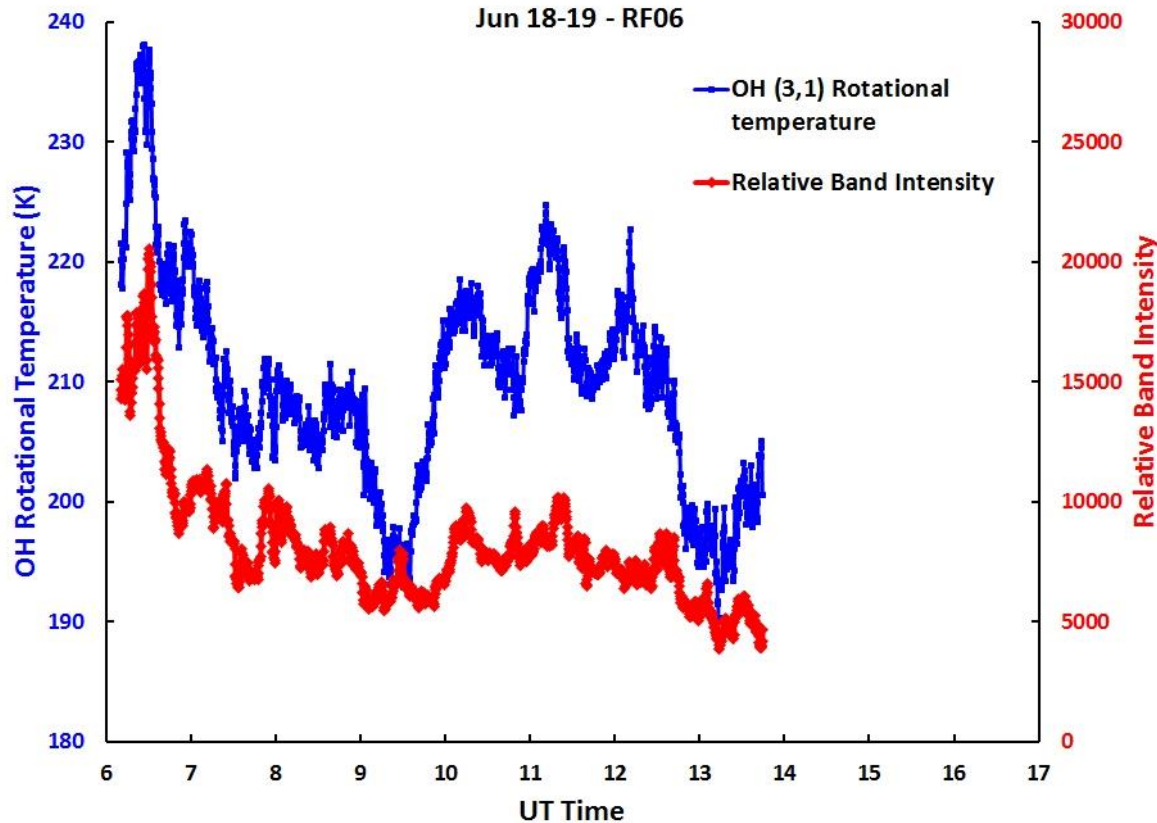
EOL Database (Aircraft Products)

- Zenith temperature and intensity profiles
- Intensity keograms (3 cameras)
- Temperature keograms (zenith camera)

The screenshot shows the EOL Field Catalog website interface. The navigation menu includes Home, Maps, Reports, Status, Products, Missions, Tools & Links, Data Access, and Help. The 'Products' menu is expanded, showing options like Satellite, Radar, Surface, Upper-Air, Aircraft (highlighted), and Model. The search bar contains the text 'Aircraft'. The main content area displays a table of data for various remote sensing products, with a red box highlighting the 'Integrated Cameras' section.

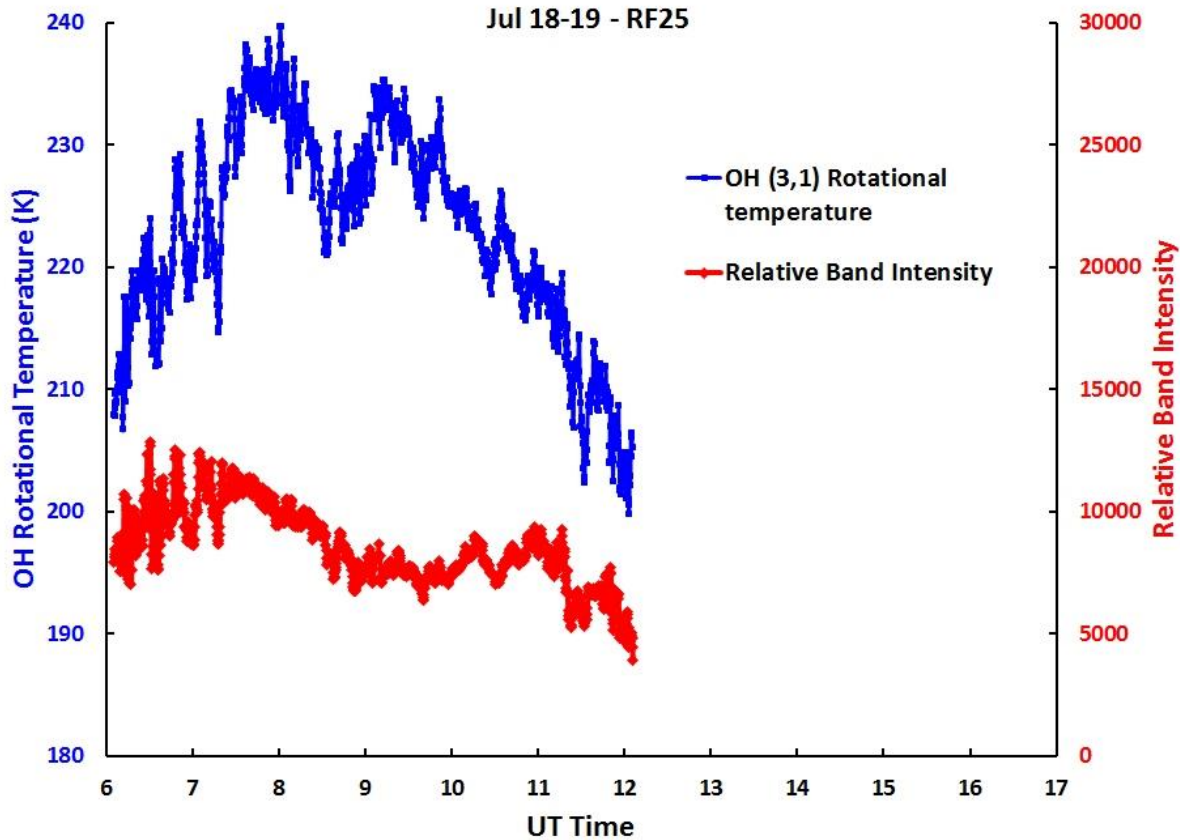
Product Name	Start Date	End Date	Loop Last 6 Images	Loop Last 12 Images	Loop Last 24 Images
Remote Sensing 2014/07/20					
NSF/NCAR GV LIDAR					
nacontour	2014/07/20 14:01 UTC	2014/07/20	Loop Last 6 Images	Loop Last 12 Images	Loop Last 24 Images
NSF/NCAR GV Mesospheric Temperature Mapper					
Integrated Cameras	2014/07/20 13:21 UTC	2014/07/20	Loop Last 6 Images	Loop Last 12 Images	Loop Last 24 Images
Zenith Keogram	2014/07/20 12:28 UTC	2014/07/20	Loop Last 6 Images	Loop Last 12 Images	Loop Last 24 Images
Zenith Profiles	2014/07/20 09:07 UTC	2014/07/20	Loop Last 6 Images	Loop Last 12 Images	Loop Last 24 Images
left camera	2014/07/20 14:10 UTC	2014/07/20	Loop Last 6 Images	Loop Last 12 Images	Loop Last 24 Images
right camera	2014/07/20 14:09 UTC	2014/07/20	Loop Last 6 Images	Loop Last 12 Images	Loop Last 24 Images
NSF/NCAR GV Microwave Temperature Profiler					
temperature profile	2014/07/18 06:00 UTC	2014/07/18	Loop Last 6 Images	Loop Last 12 Images	Loop Last 24 Images
State Parameters 2014/07/20					
Aircraft, DLR Falcon					
Flight Mixing Ratio time-series	2014/07/20 23:29 UTC	2014/07/20	Loop Last 6 Images	Loop Last 12 Images	Loop Last 24 Images
Flight Overview time-series	2014/07/04 11:00 UTC	2014/07/04	Loop Last 6 Images	Loop Last 12 Images	Loop Last 24 Images
Flight Palt time-series	2014/07/20	2014/07/20	Loop Last 6 Images	Loop Last 12 Images	Loop Last 24 Images

Zenith Profiles



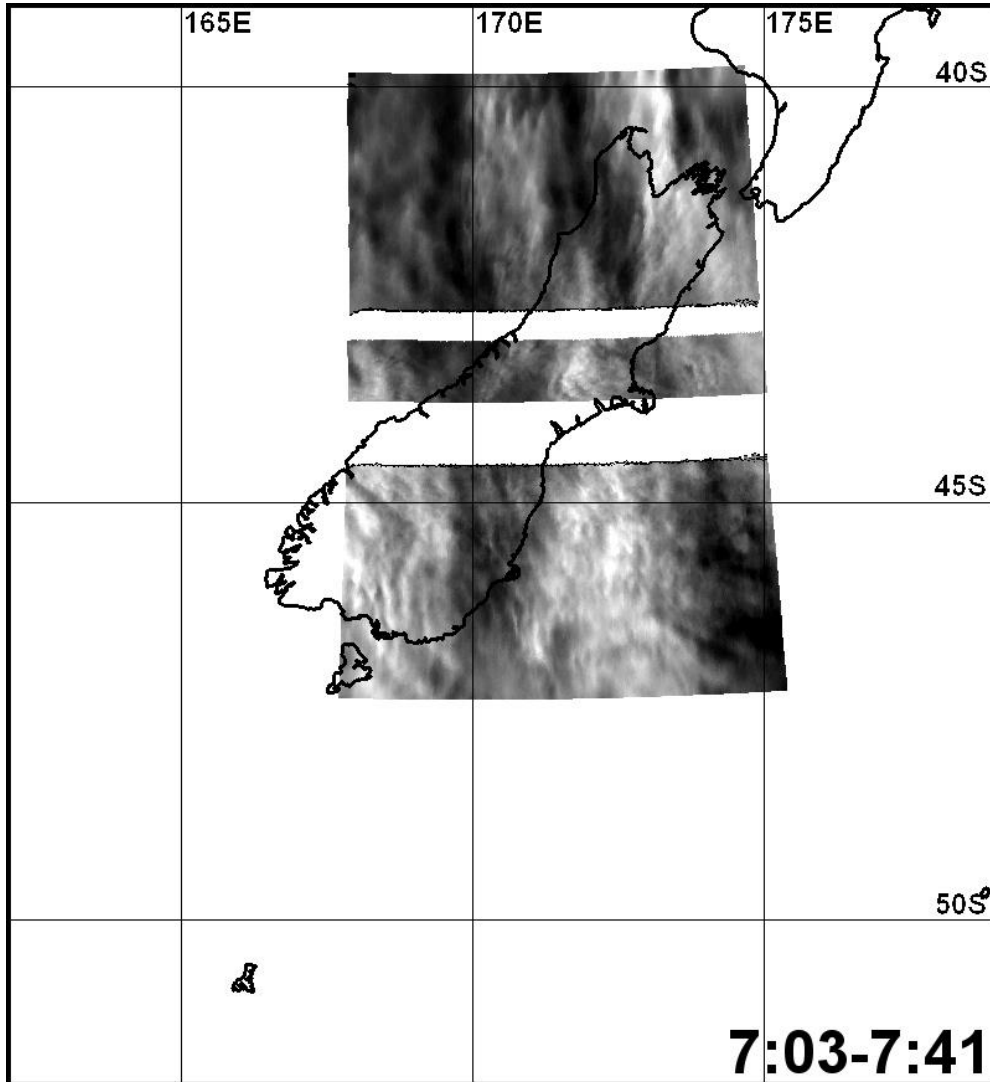
- Each point corresponds to the average value for a 20x20-pixel region
- Blue = OH (3,1) rotational temperature
- Red = OH (3,1) band intensity

Zenith Profiles



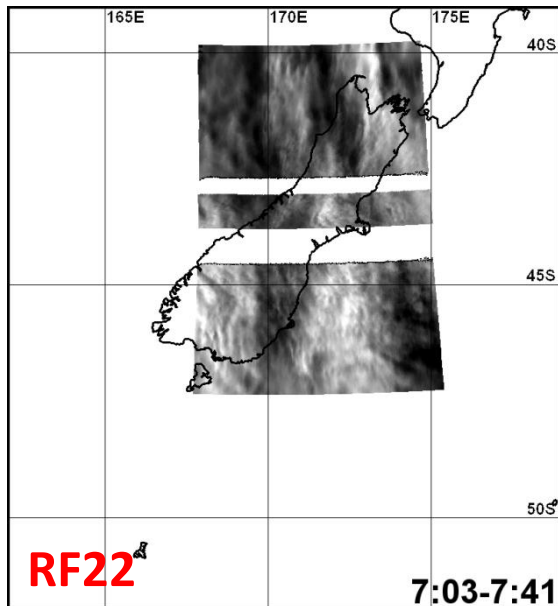
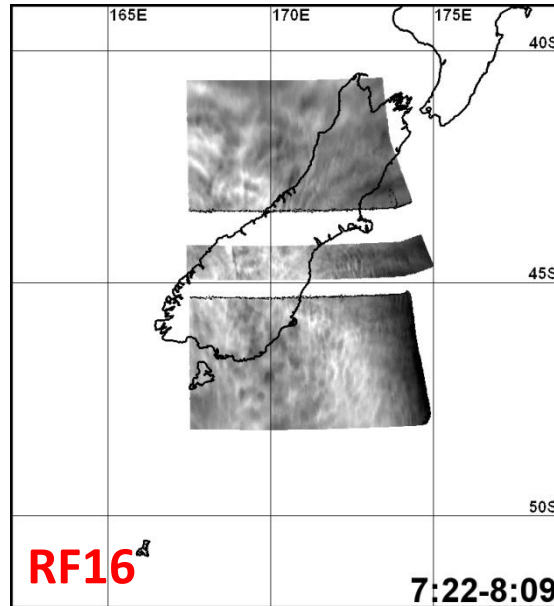
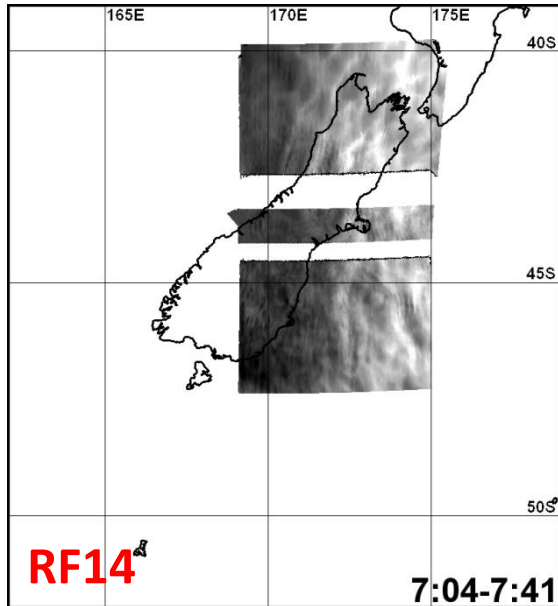
- Easy to see large scale waves, tides
- Night-to-night comparison

Intensity Keograms



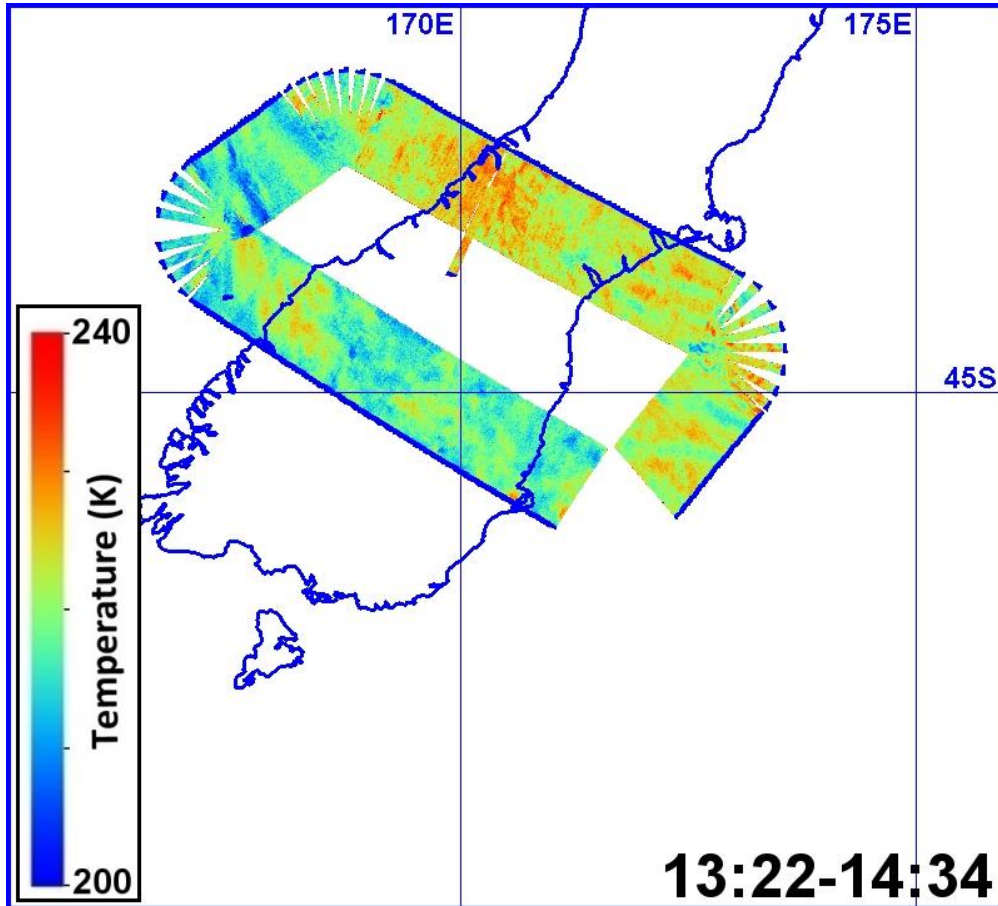
- 1 keogram per leg
- Zenith camera + 2 side cameras (except RF09)
- Extend ~450km on each side of the GV
- Time indicating the beginning and the end of the leg

Intensity Keograms



- Same map for flights over the same region (e.g., NZ, Tasman Sea, Southern Ocean) for flight to flight comparison

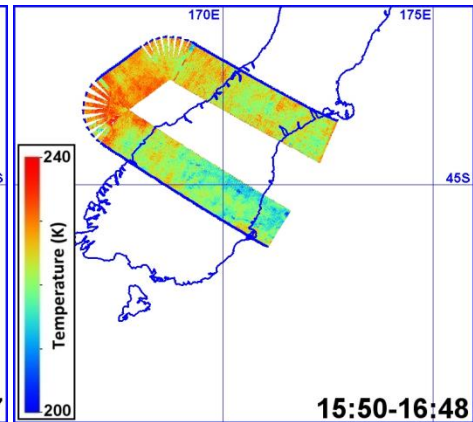
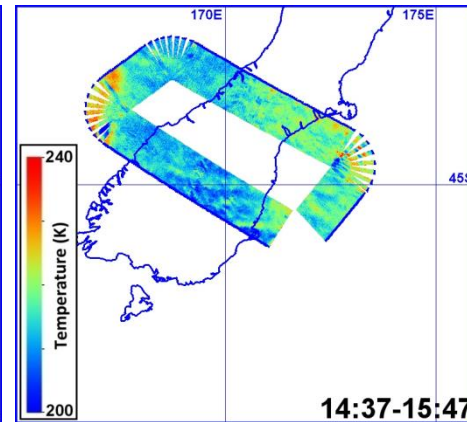
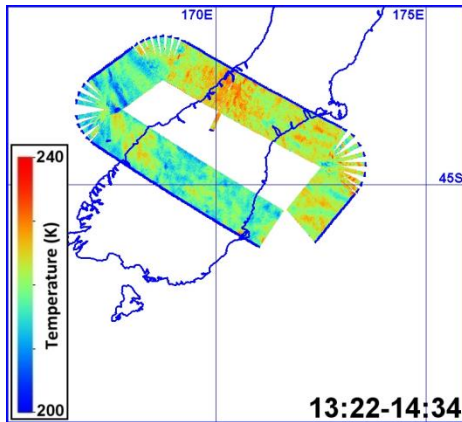
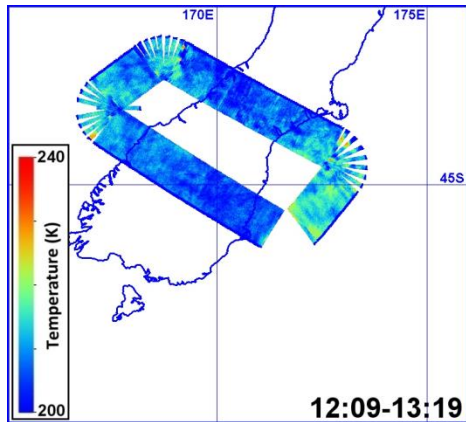
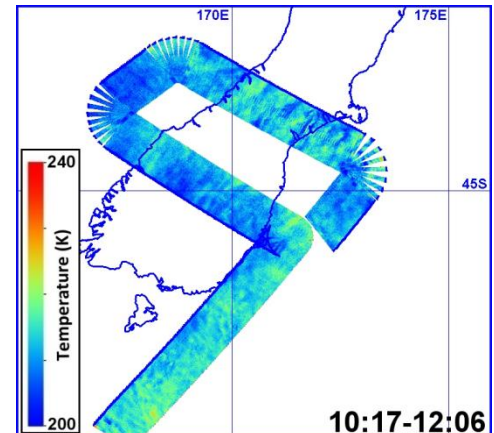
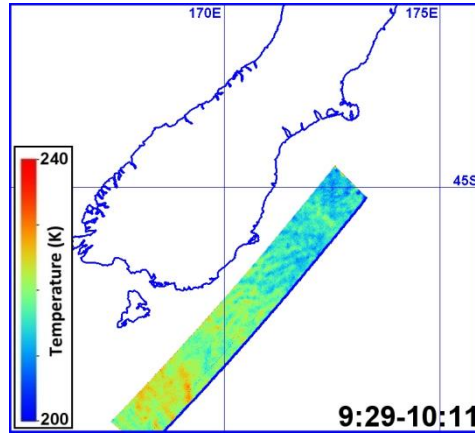
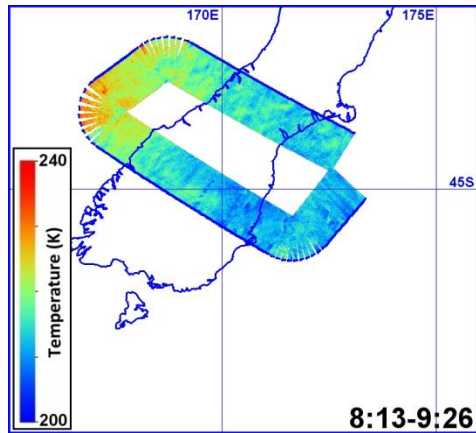
Temperature Keograms



- Several legs on one image when possible
- Only zenith camera
- ~80km wide
- Time indicating the beginning and the end of the leg
- Temperature scale on each image
- Always the same scale for a given flight

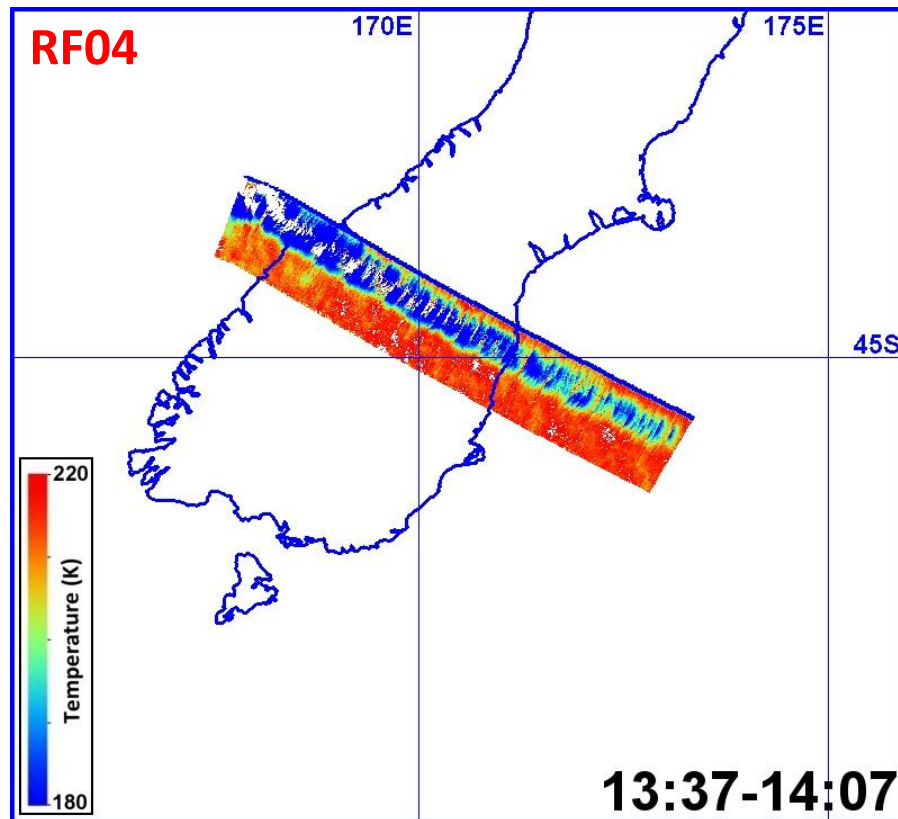
Temperature Keograms

RF12



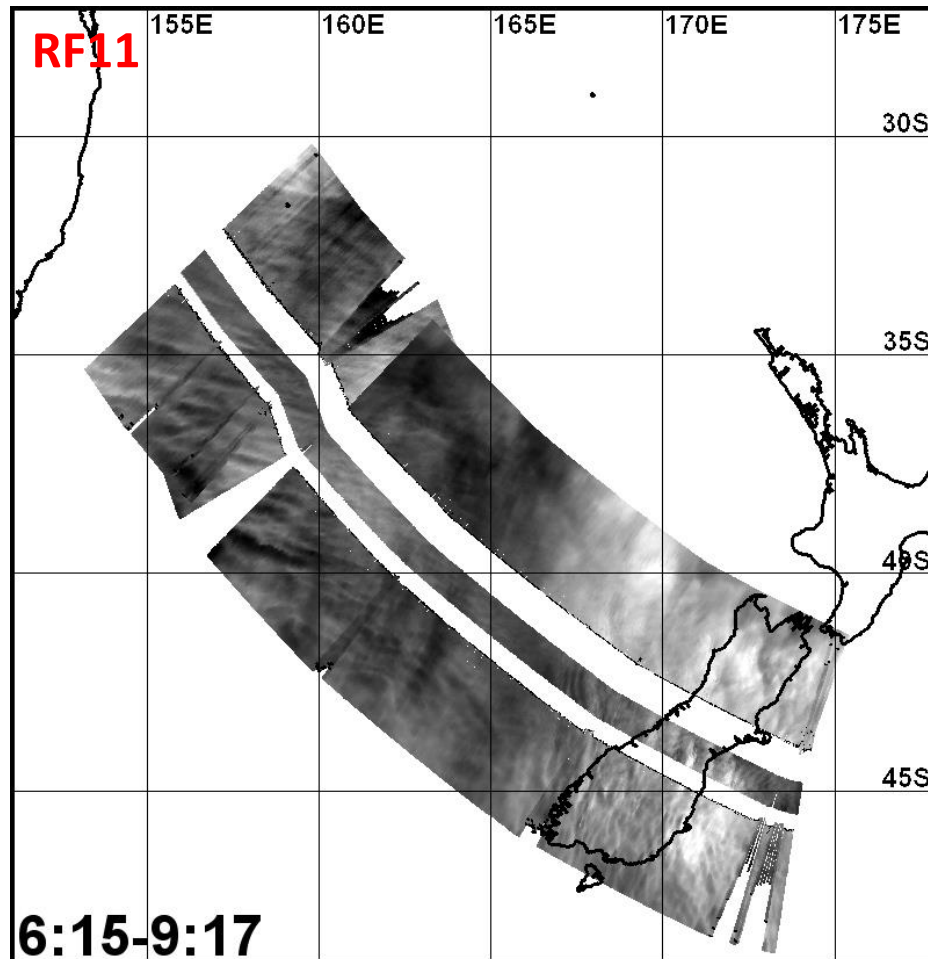
Some Possible Artifacts

- Moon in the field-of-view



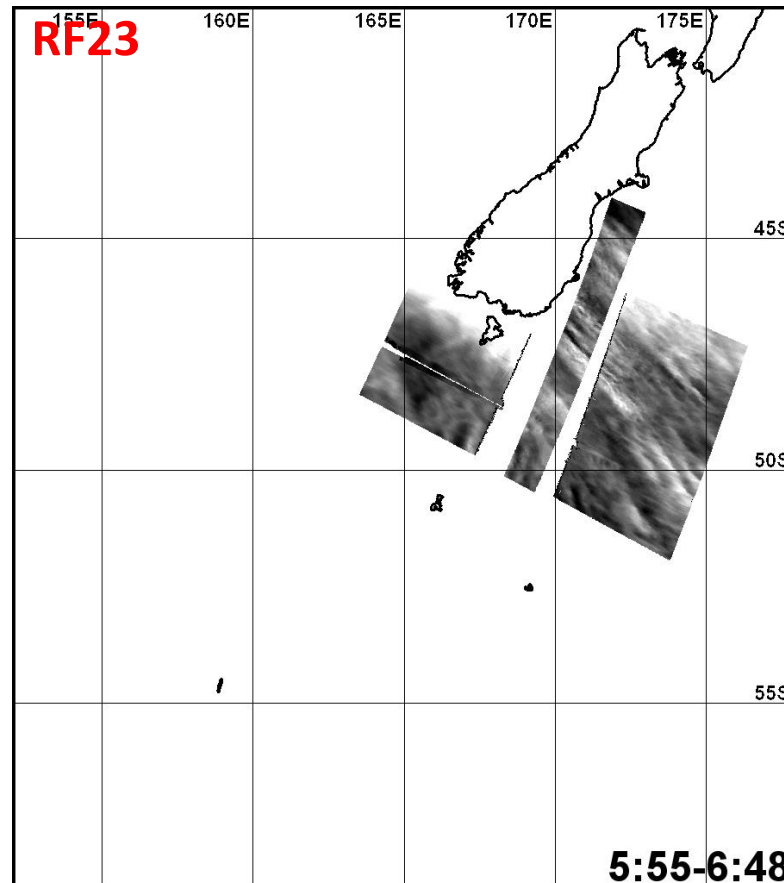
Some Possible Artifacts

- **GV changing direction**



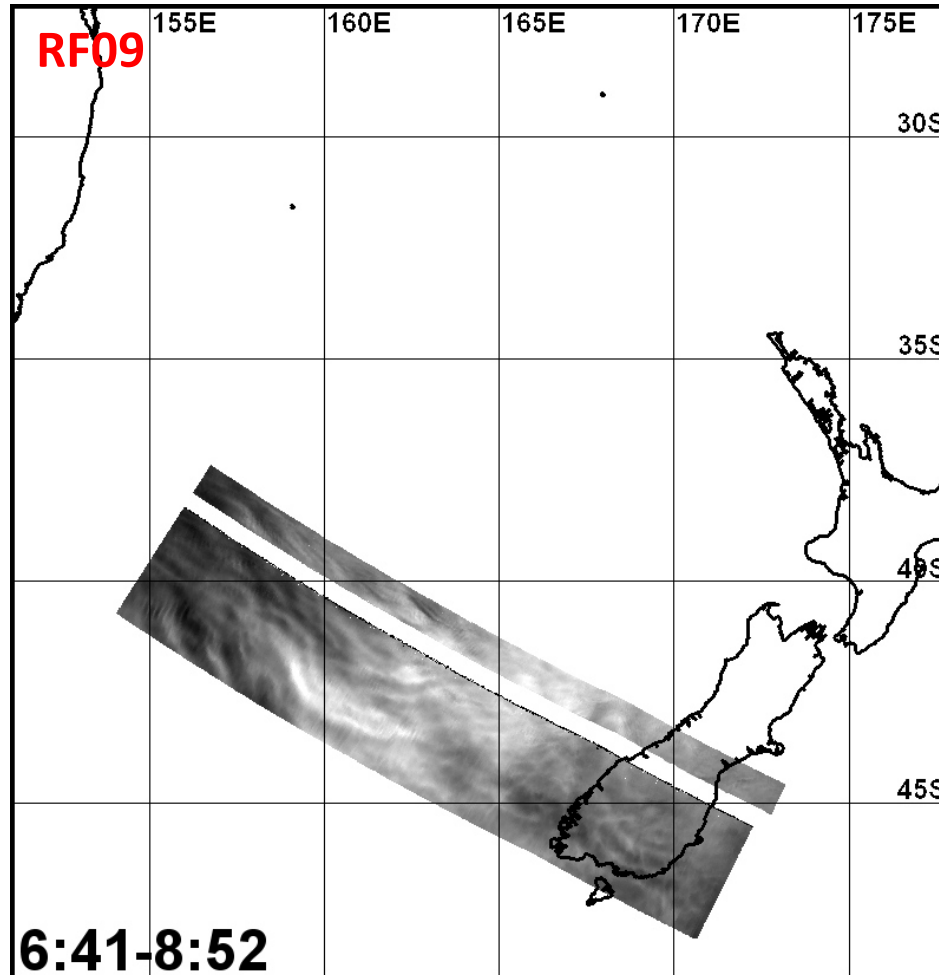
Some Possible Artifacts

- Cameras starting acquisition at different times (usually because of twilight)



Some Possible Artifacts

- One camera missing (Only RF09 due to computer problem)



Movies and Images

Not on the EOL database but available upon request:

- **Movies (temperature or intensity) with or without map**
- **Single images (temperature or intensity) in TIFF format (100 to 300Mb per flight for zenith camera, up to 12Gb per flight for both side cameras)**