OMPS Small Field of View Products

OMPS-TC-EDR and OMPS-NP-EDR

Trevor Beck
NOAA/NESDIS/STAR

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Outline

- S-NPP/J01 IDPS capable of producing OMPS SDR MedRes NP and NM (BLK2.0 PSAT21 and later)
- Medium Resolution EDR total ozone products from NDE
- 5x5 EDR ozone profile enhancements
- Status of NDE Implementation and MedRes capability

* *S-NPP someday also will make measurements at medium and high resolution(upgrade to FSW6).*

Expected J01 SDR Measurements

J01 SDR NM expected to be either of two configurations:

1) NM LowRes, 35 xtrack and 5 scans per granule
2) NM MedRes, 103 xtrack and 15 scans per granule

NP MedRes, 5x5, 5 scans per granule X 5 xtracks. 400 scans per orbit. Wavelength dimension ~150 measurements from 250nm to 310nm.

Images shown in this presentation are J01 Proxy data derived from NPP and NPP diagnostic, from off-line ADL runs at NOAA by the OMPS STAR SDR team.

These are SDR formats. the NadirMapper RDR measurements can be made at different spatial and spectral measurements. The IDPS system will aggregate pixels to produce either 35x5 or 103x15.

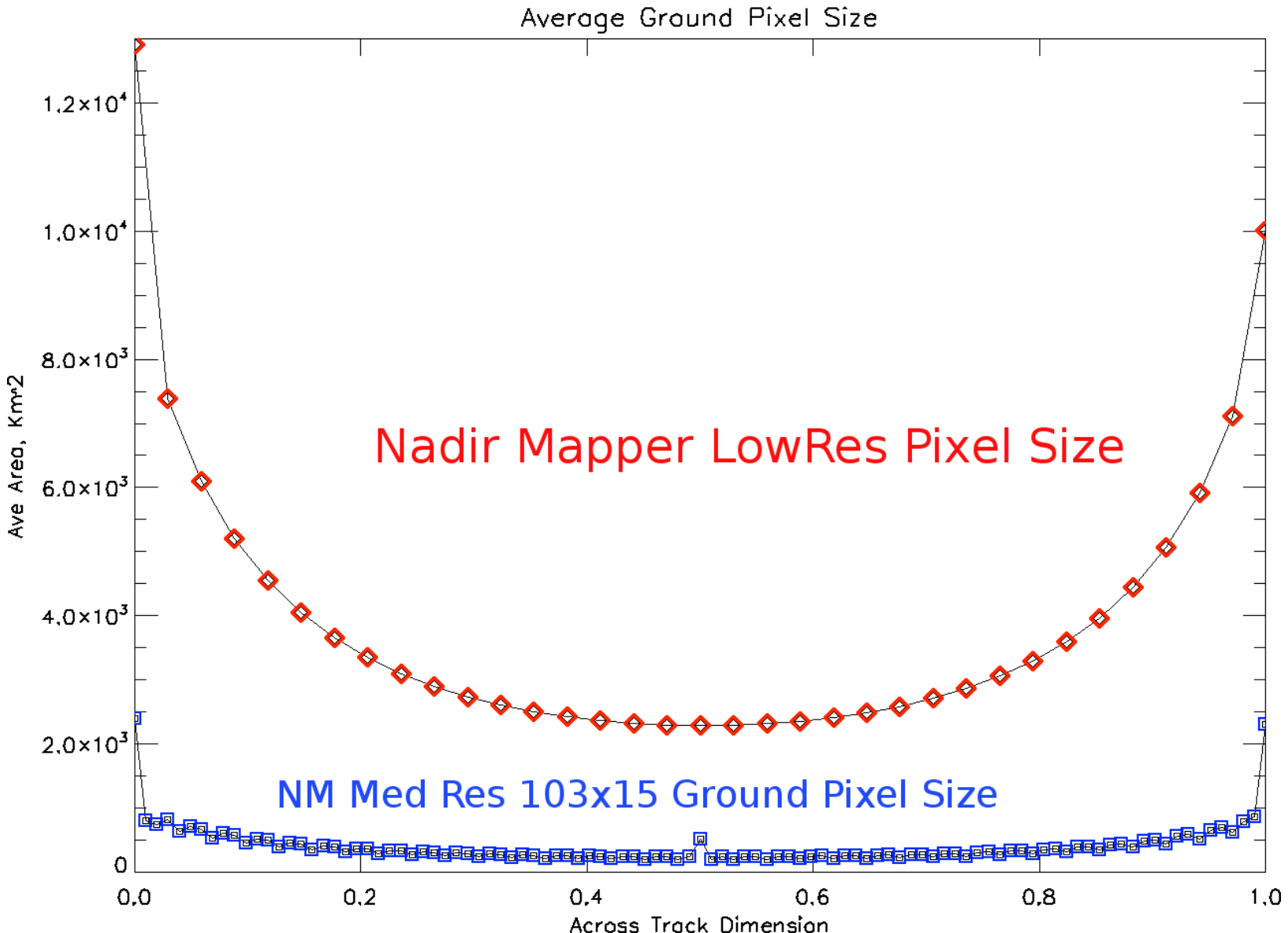
NM Low Res SDR Format

- Same number of ground pixels as current nominal NPP SDR. 35X5.
- This is the expected nominal SDR format from L+3 months to L+9 months
- Approximate same wavelength dimensions and coverage as NPP 35x5.
- J01 RDR measurements will be made at higher spatial resolutions, the IDPS will aggregate to 35x5.

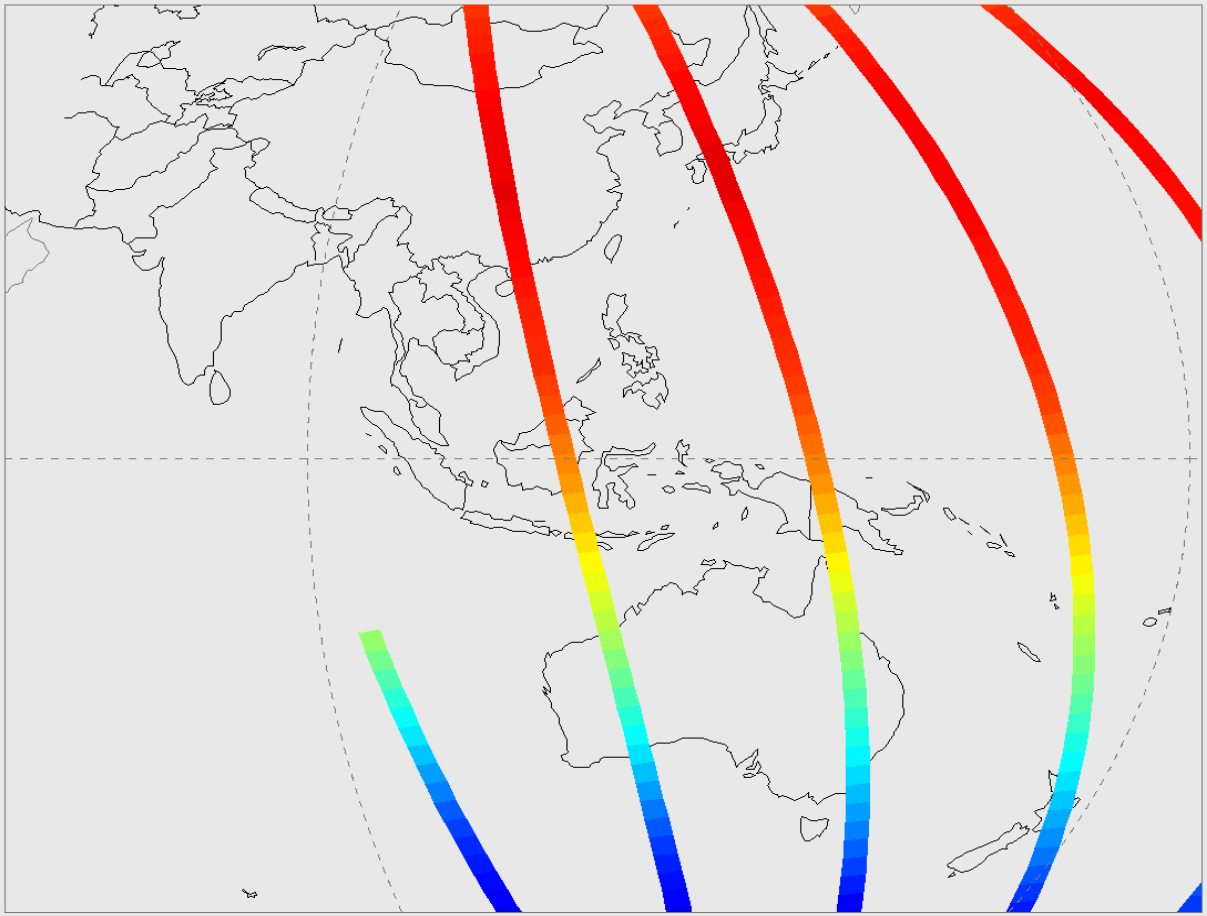
NM Med Res SDR Format

- This is the expected nominal SDR format from L+9 months onward
- 15 scans per granule, 103 xtrack pixels
- Approximate same wavelength dimensions and coverage as current NPP NM.
- RDR measurements will be made at higher spatial resolutions, the IDPS will aggregate to 103x15.

NM Ground Pixel Sizes



J01 and S-NPP NP SDR



S-NPP Configuration

Ground pixel size:
250Km . 250Km

80 ground pixels per orbit

Viewing Zenith Angle
Approximately zero°

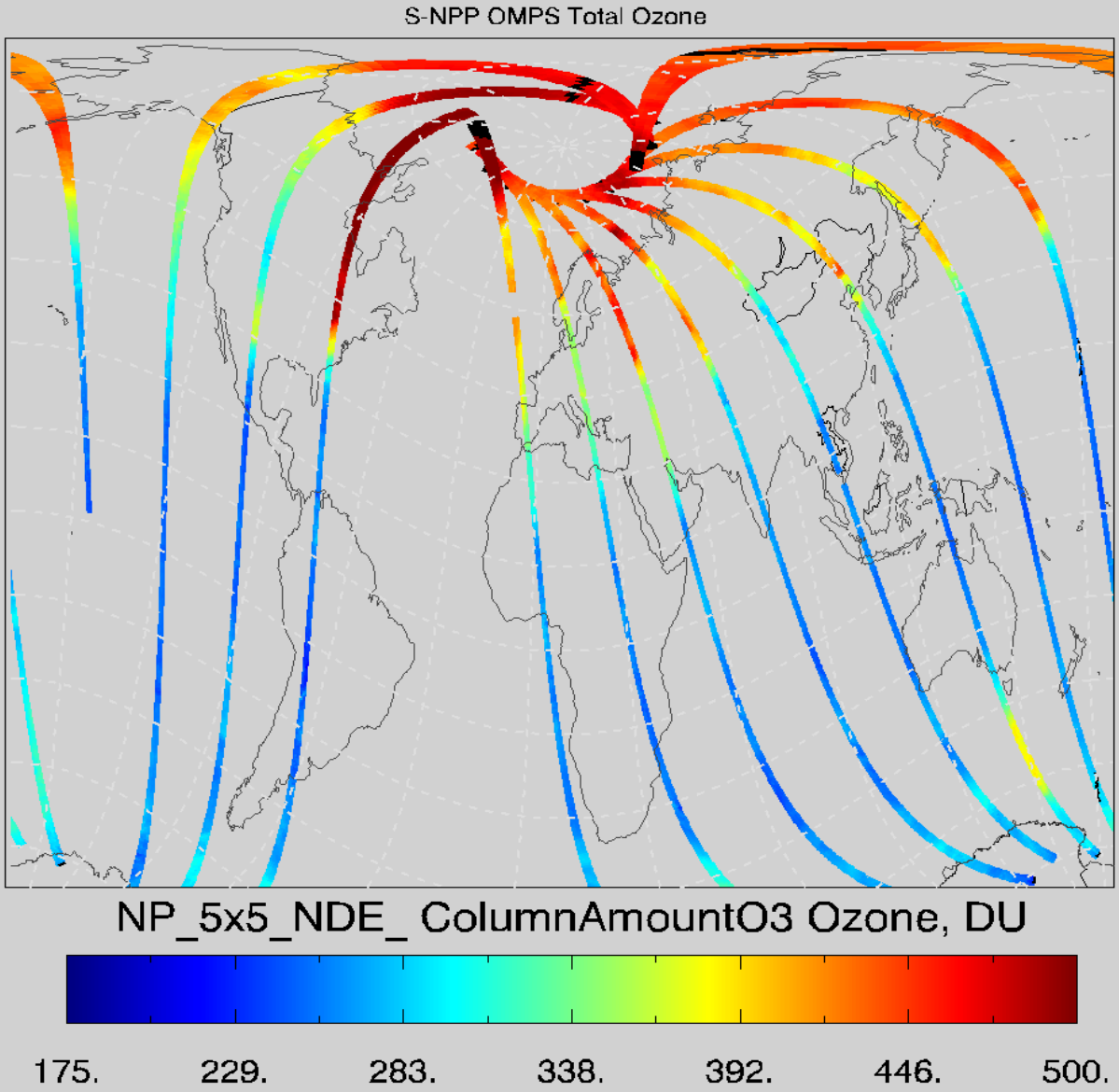
J01 Configuration

J01 Ground Pixel size:
50Km . 50Km

2000 pixels per orbit=80*5*5

Viewing Zenith Angle ranges from -7.5° to 7.5°

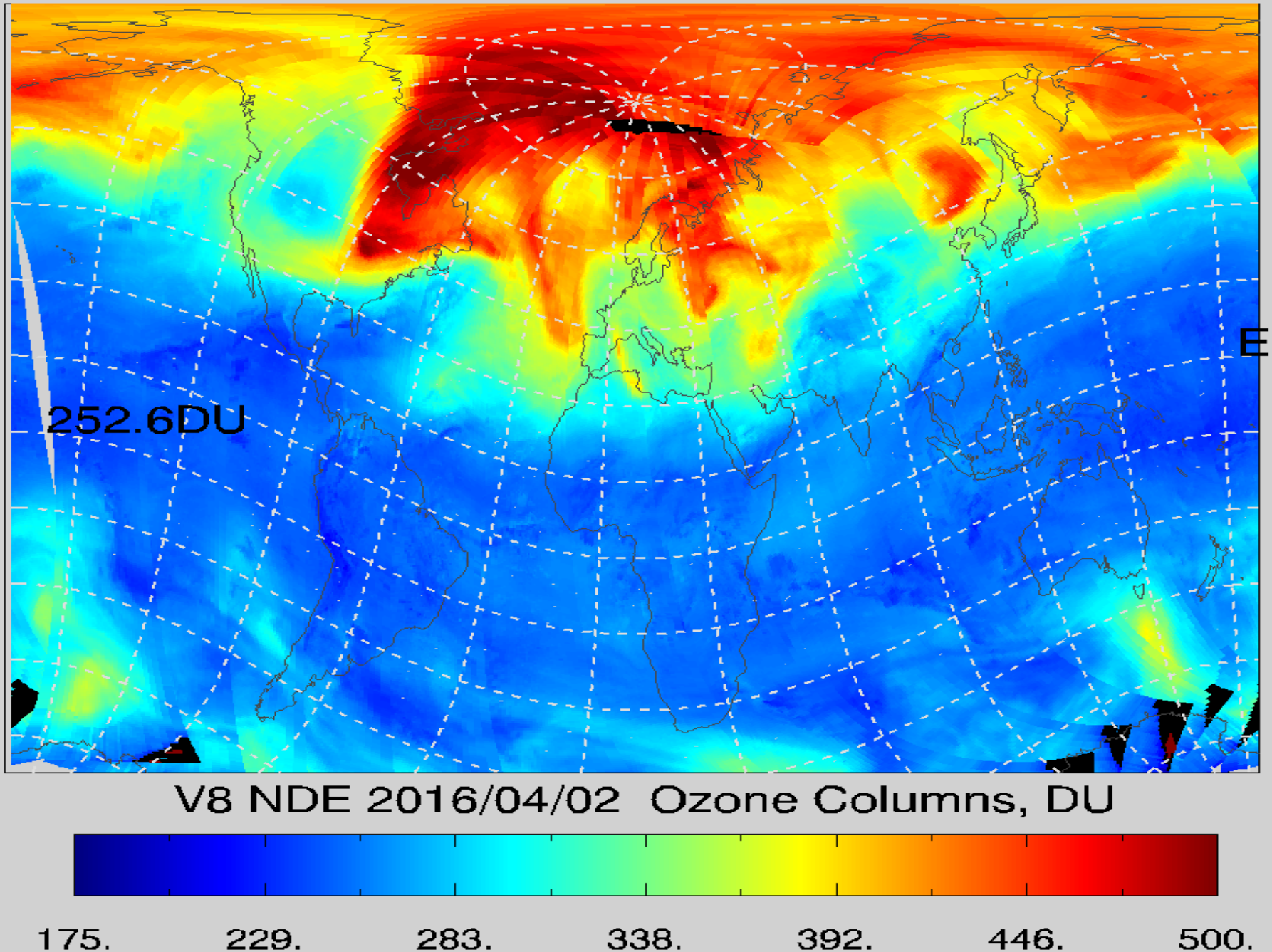
5x5 Ozone Retrieval NP



5x5 Ozone retrieval Example.

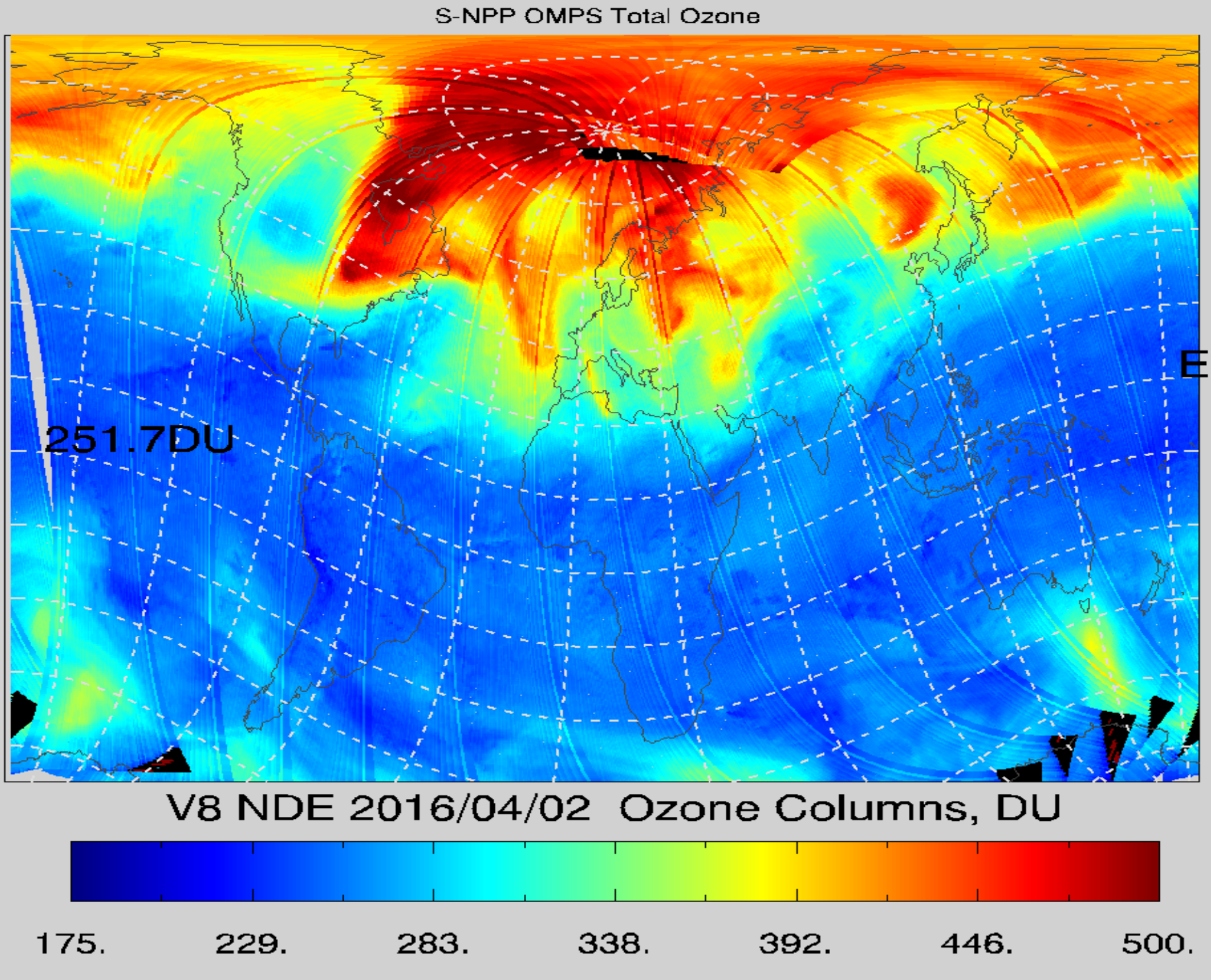
We took S-NPP diagnostic data and converted to Nominal. Then it is processed through ADL BLK2.0 to SDR level.

The image is created by the NDE V8Pro ozone profile retrieval code. This science code is currently undergoing security code review at NDE.


S—NPP OMPS Total Ozone
252.6DU
Eq
V8 NDE 2016/04/02 Ozone Columns, DU
175.
229.
283.
338.
392.
446.
500.

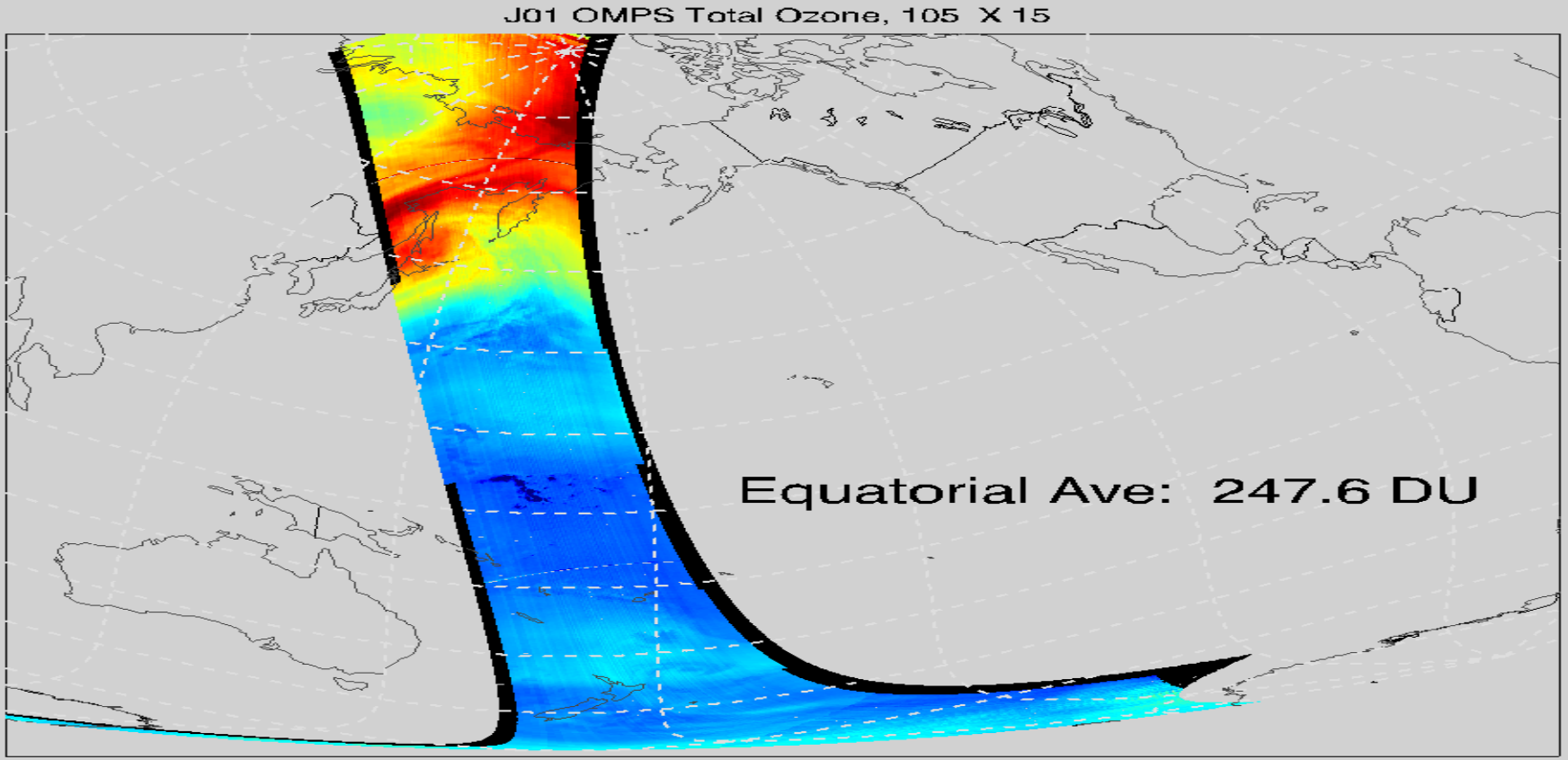
MedRes TC Ozone Retrieval

- The Following page shows 103x5 ozone
- Image is upsampled version of a 35x5 measurement.
- There are striping problems.
- This is a good EDR test dataset because we understand the 35x5 SDR inputs. The upsampled 103x5 have the same characteristics.


S-NPP OMPS Total Ozone
251.7DU
Equ
V8 NDE 2016/04/02 Ozone Columns, DU
175.
229.
283.
338.
392.
446.
500.

OMPS 43A Proxy Data

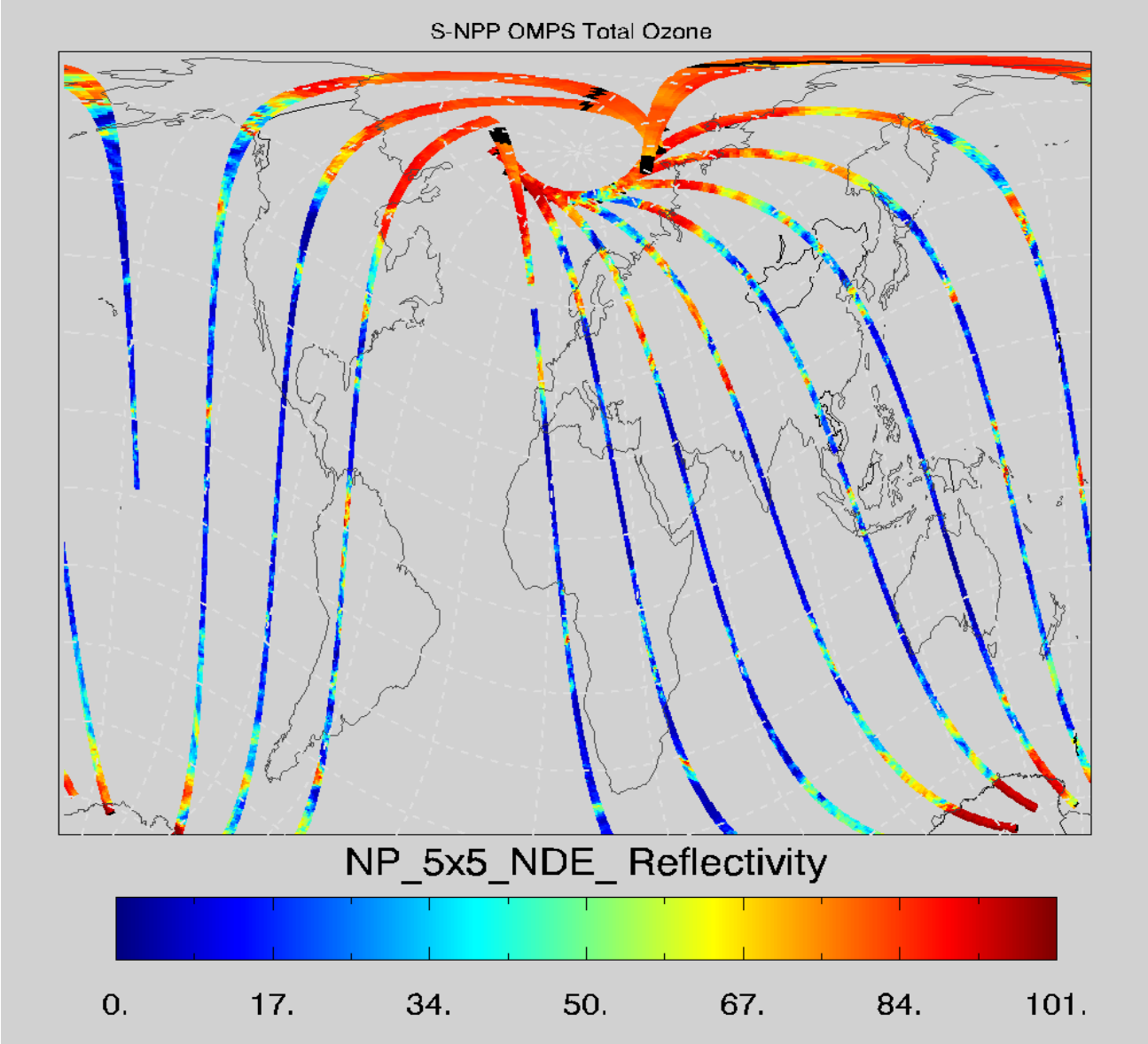
Our Current best SDR test dataset for EDR testing is based on 2016/04/02 35x5nm 5x5np.



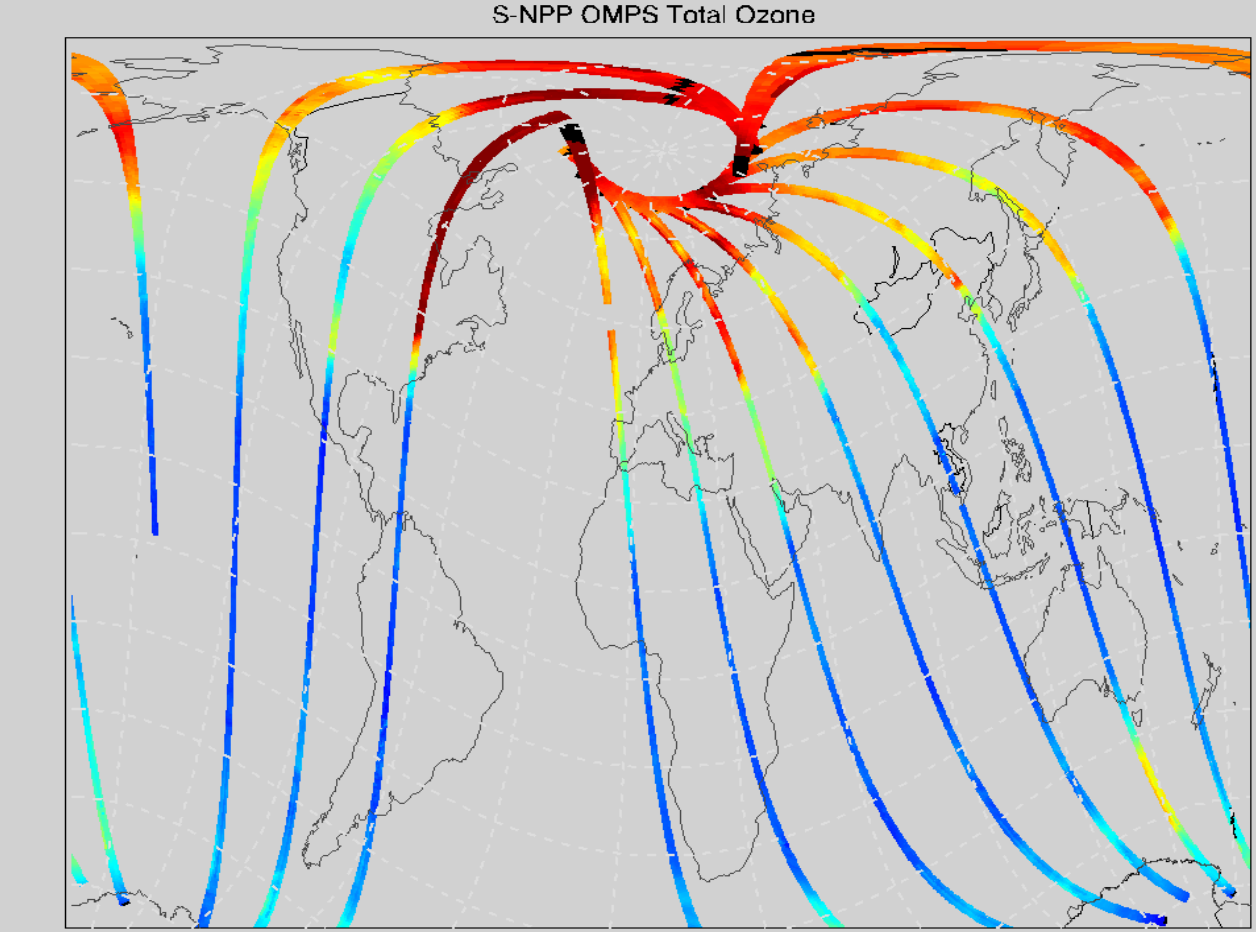
Currently Delivered NDE V8PRO

- Based on the V8SBUV version 8.
- Sized to 5x5 output, netcdf-4.
- 2000 profiles per orbit.
- RT lookup tables include VZA index. Total ozone computation uses VZA,RAZA.
- Profile single scatter RT code uses modified path length: assume we are looking Nadir but a longer path length: 1/cos(VZA) + 1/cos(SZA).
- Reasonable approximation, max VZA is ±7.5°
- Our implementation relaxes some SBUV/2 specific constraints in the V8SBUV code: grating drive, 12 monochromator & 12 photometer paired measurements, nadir only. There was a major rewrite done to the SBUV/2 code.
- We can account for separate viewing geometries in the NM, NP SDR inputs. This was developed using OMI inputs: UV1,UV2 differences.

Reflectivity V8pro 2016/04/02



Retrieved Column 2016/04/02
Sum of Retrieved 21 layer profile



Conclusion

- The V8 total ozone 103 X 15 algorithm had been put into the NDE system.
- A 5x5 capable ozone profile retrieval code is under review for inclusion in the NDE processing system for JPSS-1.
- The NP 5x5 total ozone parameters are as expected(2% bias).
- We haven't gotten the results from the V8PRO ozone profiles that we would like(wavelength problem).
- NOAA STAR is on track for 5x5 NP EDR ozone profiles based on the legacy V8SBUV retrieval for J01 OMPS.
- NOAA STAR made significant enhancements to the SBUV/2 Version 8 ozone profile algorithm based on OMI and OMPS experiences.