GEMS GRG WP3
Prototype user services

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Work Package Planning and Time table

Task Number	Task Name	Start Month	End Month	Total Person Months.
3.1	Global distributions of background levels of pollutants by MOZART-3	13	18	1
3.2	Global distributions of background levels of pollutants by TM5	13	18	1
3.3	Global distributions of background levels of pollutants by MOCAGE	13	18	1
3.4	Consolidation of results of the three CTMs	15	18	1
3.5	Selection of appropriate methods for cloud and surface albedo effects on UV radiation	1	3	3
3.6	Test implementation and comparisons of suitable parameterizations for clouds and surface albedo	3	9	6
3.7	First versions of LUTs for surface UV irradiance	9	12	3
3.8	First versions of interpolation methods within LUTs	12	15	3
3.9	Development of validation software	12	18	2
3.10	Initial implementation of UV calculation within ECMWF system	15	18	4
3.11	Preliminary validation of UV products	15	18	4

In the "Description of Work" it has been said that "Due to computational requirements, a lookup-table (LUT) approach will be adopted, in which the UV calculations will be calculated and tabulated for a wide range of input variables (e.g. ozone, cloud optical depth, surface albedo, aerosols)". "Branch 1"

Use of the ECMWF extended UV-B and UV-A processor would be a more justified approach (if afforded) "Branch 2"

TECHNICAL MEMORANDUM

A Processor to get UV-B and UV-A Radiation Products in/from the ECMWF IFS

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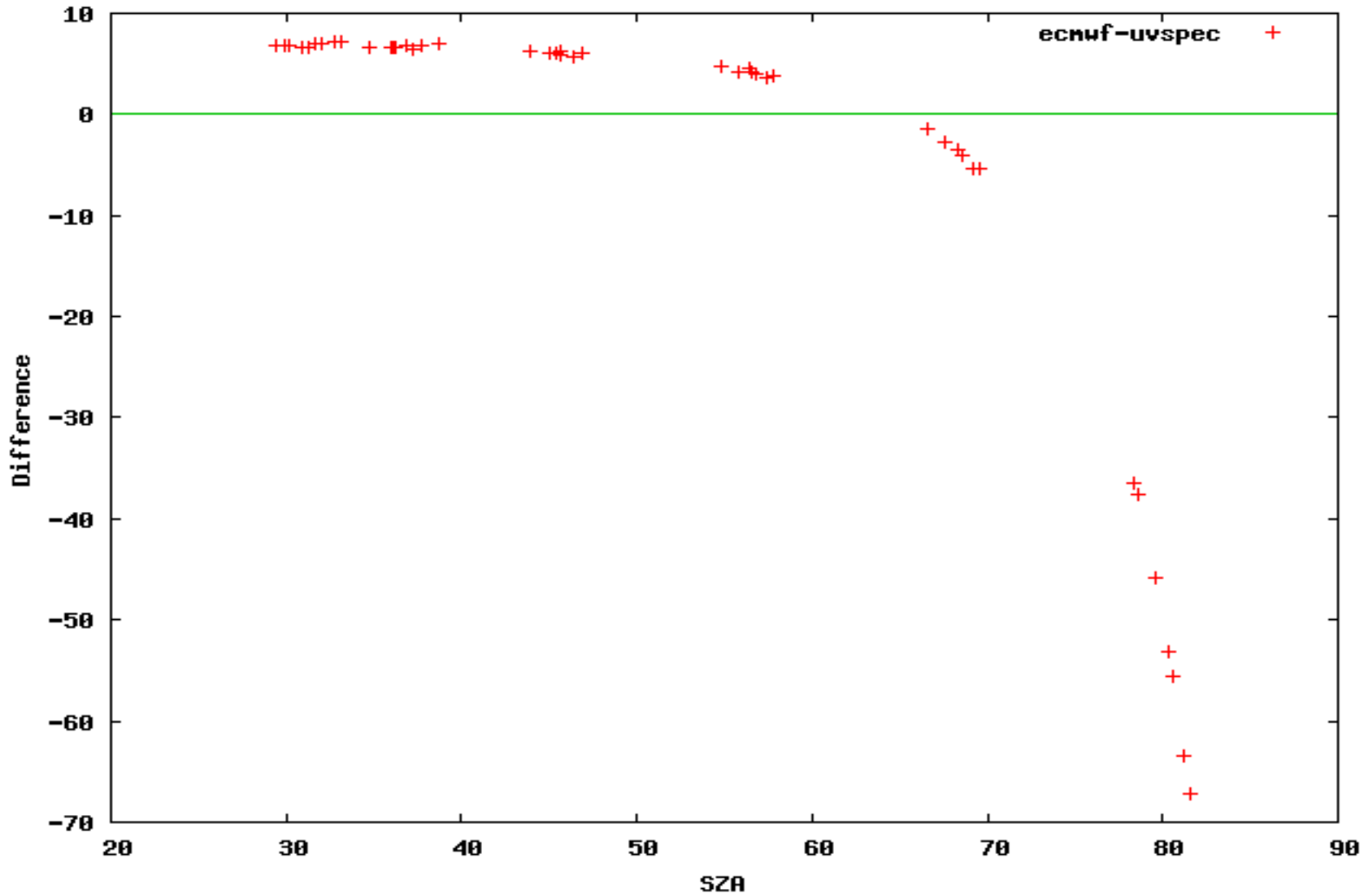Jean-Jacques.Morcrette@ecmwf.int

November 11, 2005

GEMS A

Ongoing work with the processor ("Branch 2")

Work done in LUT approach ("Branch 1")

UV **albedo** climatology from TOMS

Tanskanen, A., A. Arola, J. Kujanpää, Use of the moving time-window technique to determine surface albedo from the TOMS reflectivity data, In: Proc. SPIE Vol. 4896, p. 239--250, 2003.

To account for MRO clouds consistently is a challenge.

Current plan is to use PAR (440-690 nm) radiation from ECMWF. Both cloudy and clear-sky PAR needed.

Outline of the algorithm steps for UV-index

1) clear_uvi = LUT(O3, aerosols, albedo, sza, altitude)

2) ccf = LUT(PAR_cloudy/PAR_clear, sza)

3) cloudy_uvi = ccf*clear_uvi

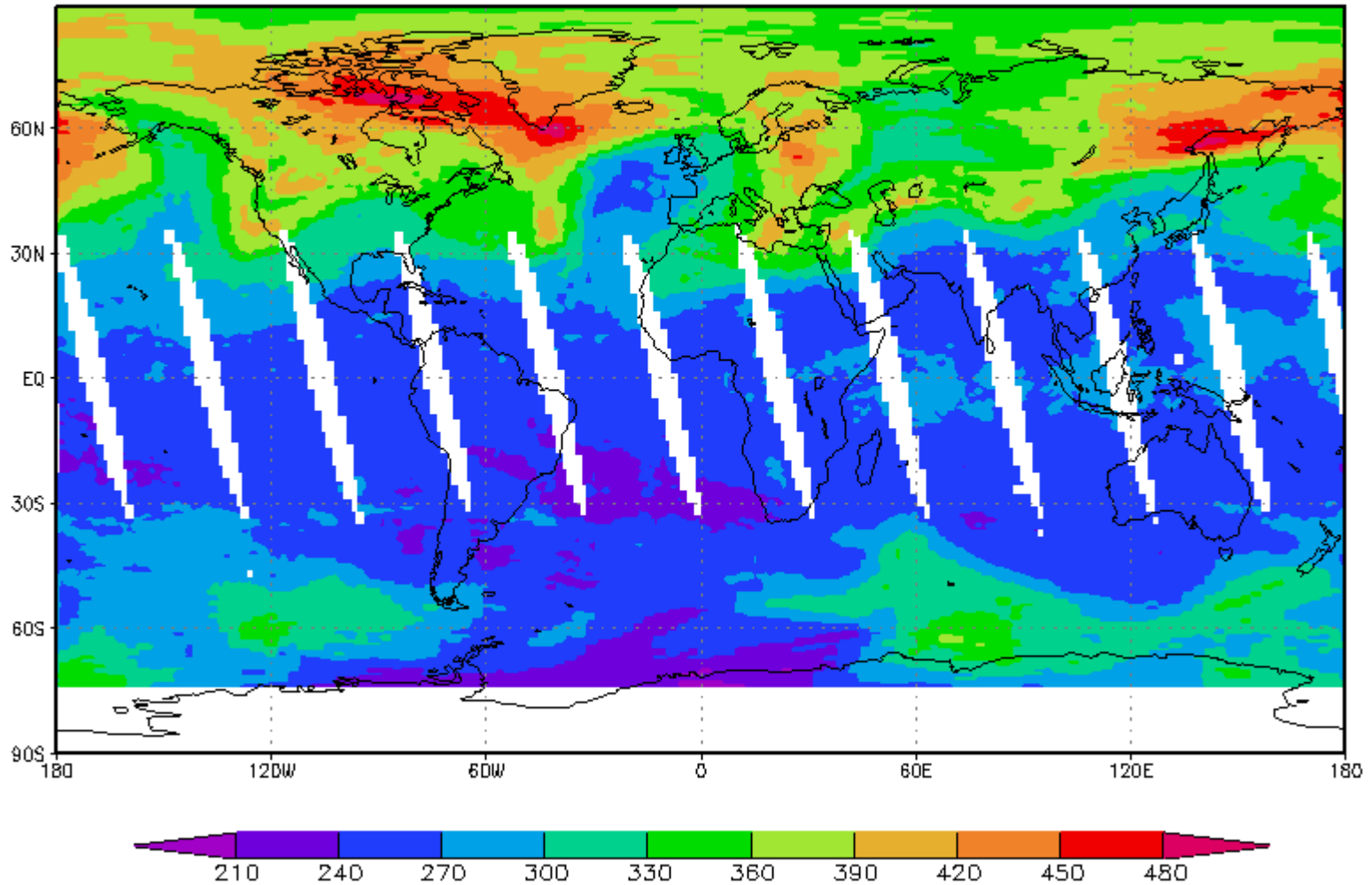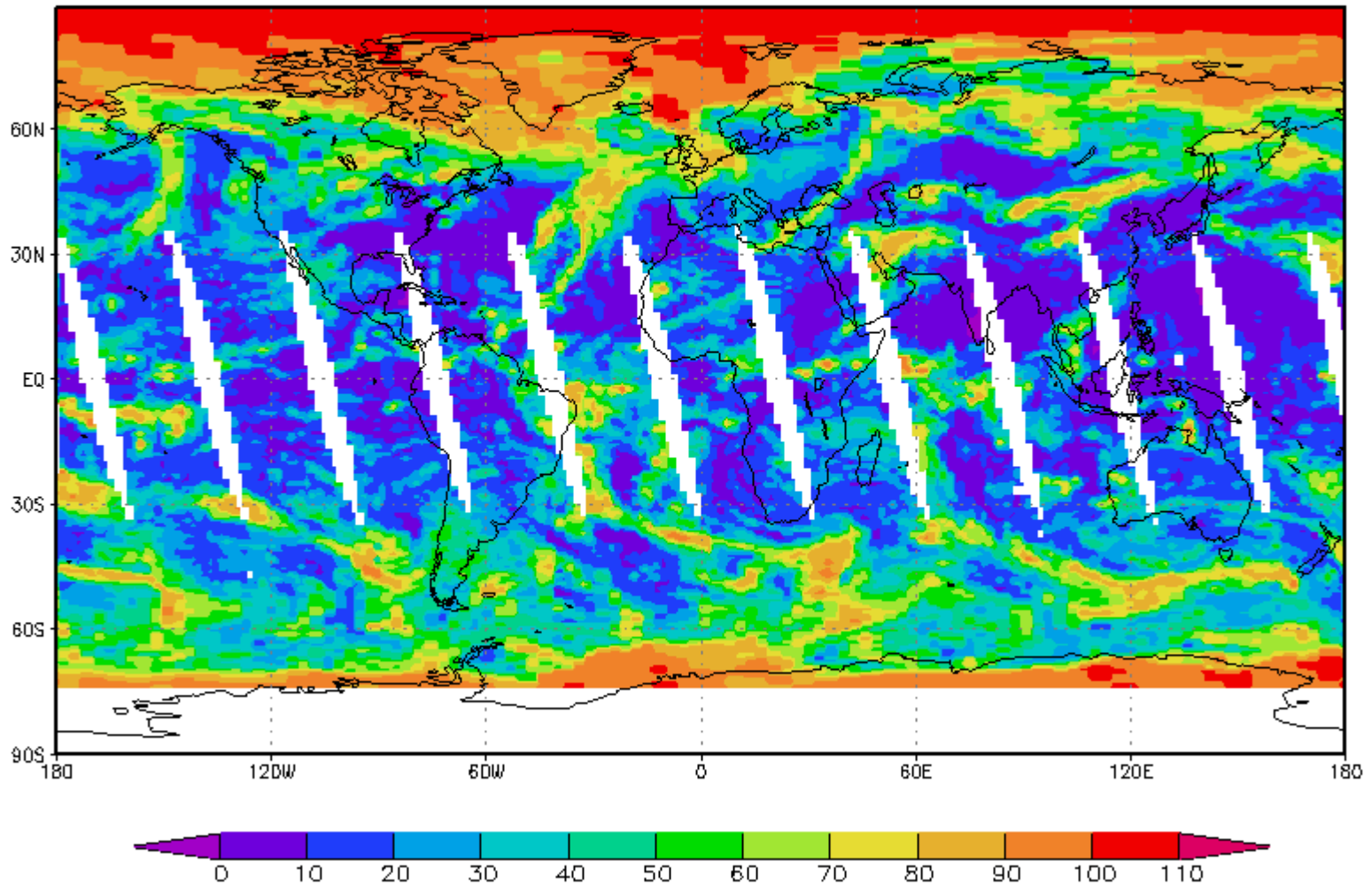**4) UVI = c_tot*cloudy_uvi+(1-c_tot)*clear_uvi**

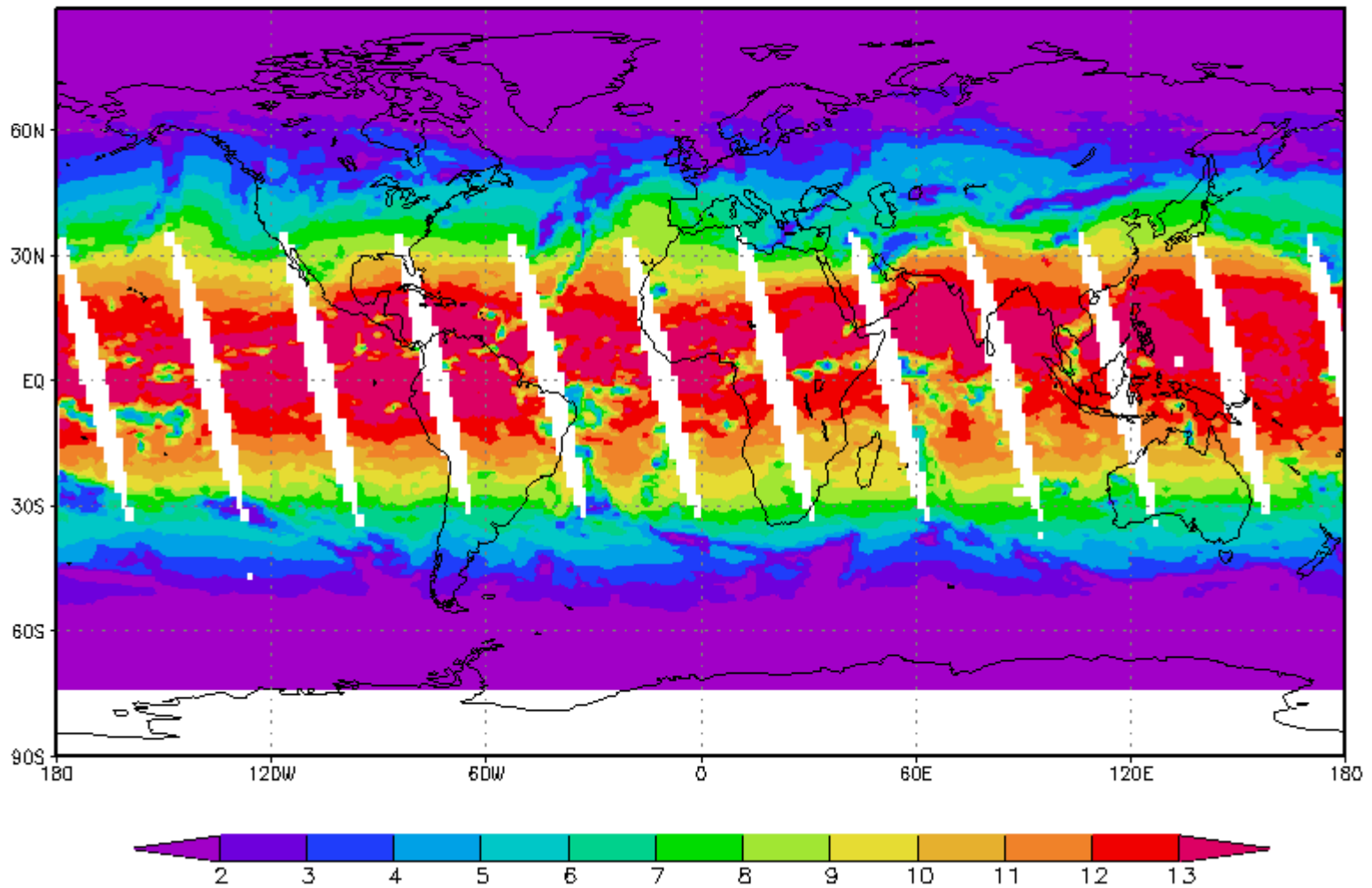Albedo 15 April
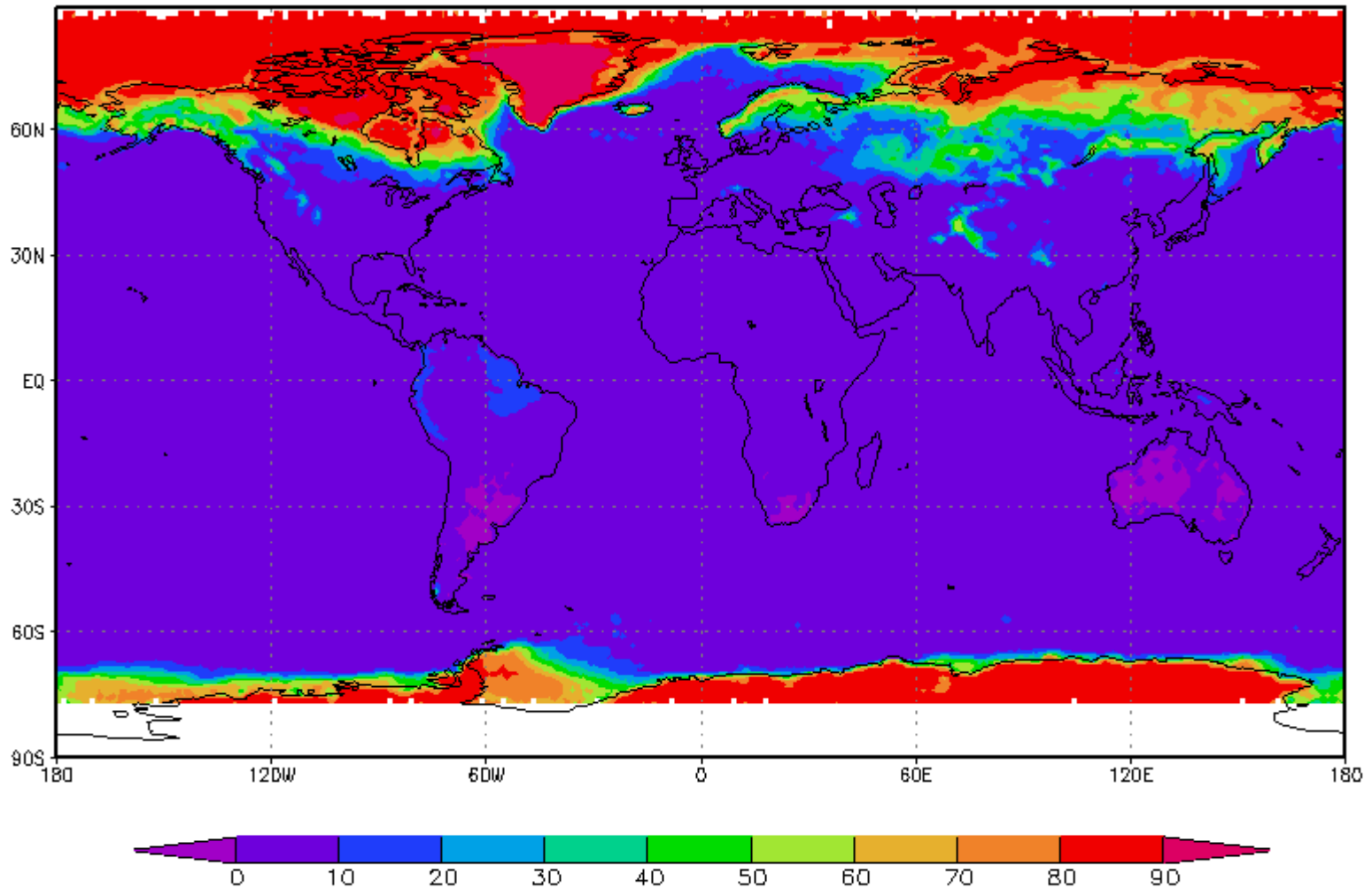
TOMS Ozone 15 April 2004

TOMS Reflectivity 15 April 2004

Noon time UVI 15 April 2004

ISSUES RELATED TO THE FUTURE WORK

For the next 18 month detailed plan it should be decided how to break down the work between LUT approach and ECMWF processor ("Branches 1 and 2").

This decision depends mainly on the computer demand and archiving requirements vs. available resources.

For LUT approach PAR (440-690 nm) surface irradiance should be operationally archived also for clear-sky case (currently cloudy one is only archived).

NEXT 18-MONTH PLAN

- **Task 1 and 2 for the validation of processor: a) validation of the code (FMI), b) validation against the measurements (DMI).**

- **LUT approach is carried along: Task 3 to validate it against the measurements (DMI).**

- **Task 4 "options to incorporate the aerosols".**

- **Implementation within ECMWF system (Task 5).**

- **Regarding Tasks other than UV: some sample data from CTMs available?**