

# A database of spectral surface reflectivity in the range 335-772 nm derived from 5.5 years of GOME observations

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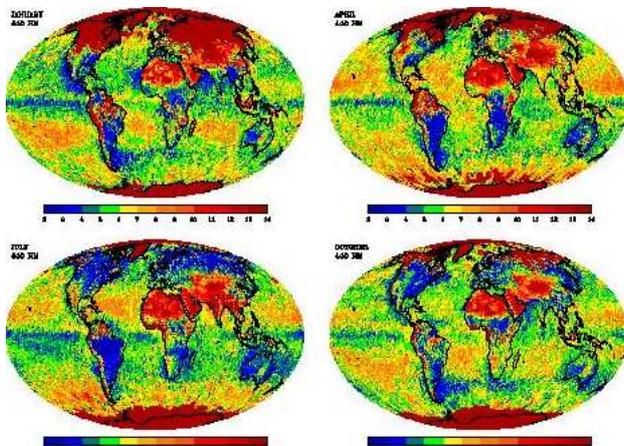


## INTRODUCTION

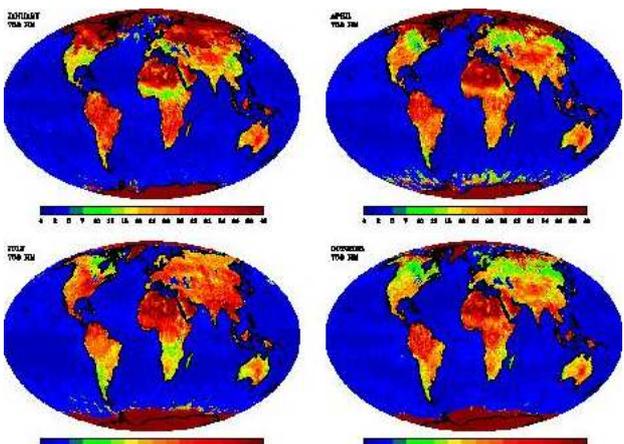
A global database of Lambert-equivalent reflectivity (LER) of the Earth's surface has been constructed, by analyzing observations of the reflectivity at the top of the atmosphere made by the Global Ozone Monitoring Experiment (GOME). Since its launch on board the ERS-2 satellite in April 1995, the GOME instrument has been measuring spectra of the Earth between 237-794 nm, with a spectral resolution between 0.2-0.4 nm and a spatial resolution between  $40 \times 80 \text{ km}^2$  and  $40 \times 320 \text{ km}^2$ . The LER database covers eleven 1-nm wide wavelength bins centered at 335, 380, 416, 440, 463, 494.5, 555, 610, 670, 758, and 772 nm, which were selected for various retrieval applications (see Table below) (Koelemeijer *et al.*, 2003). The database has a spatial resolution of  $0.25^\circ \times 0.25^\circ$ , is made for each month of the year, and pertains to the period June 1995 - December 2000 (Fournier *et al.*, 2004). Typical spectra of various surface types are presented. Attention is paid to atmospheric correction, residual cloud contamination and instrument degradation. We have found satisfactory agreement between the database at 380 nm and the TOMS LER database at 340-380 nm, with negligible average difference and a standard deviation of 0.013. The database presented here can be used to improve retrievals of trace gases, clouds and aerosols from GOME, SCIAMACHY, OMI, and GOME-2.

$\lambda$ (nm)	retrieval application
335.0	O <sub>3</sub> (Huggins band)
380.0	aerosol
416.0	aerosol
440.0	NO <sub>2</sub>
463.0	O <sub>2</sub> -O <sub>2</sub> (477 nm band)
494.5	aerosol
555.0	vegetation
610.0	aerosol
670.0	cloud detection
758.0	O <sub>2</sub> (A band)
772.0	O <sub>2</sub> (A band)

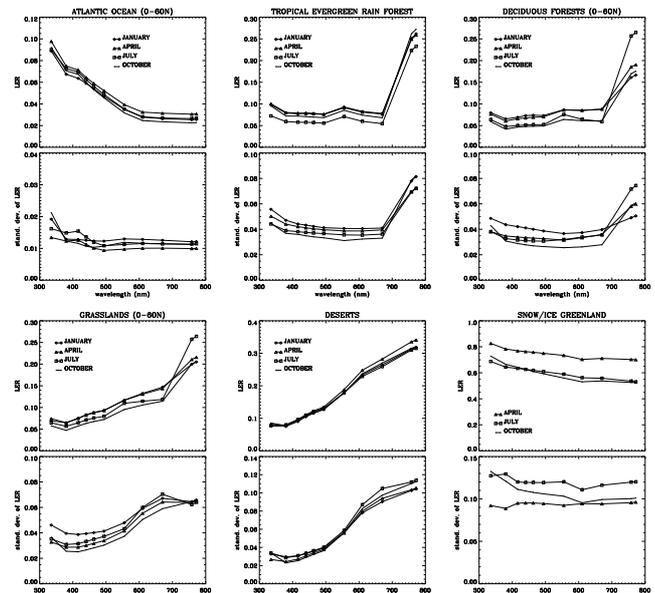
## 1. Seasonal variations of LER values at 440 nm



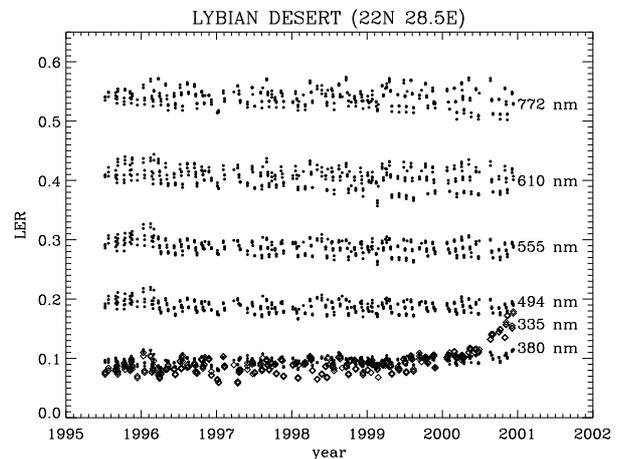
## 2. Seasonal variations of LER values at 758 nm



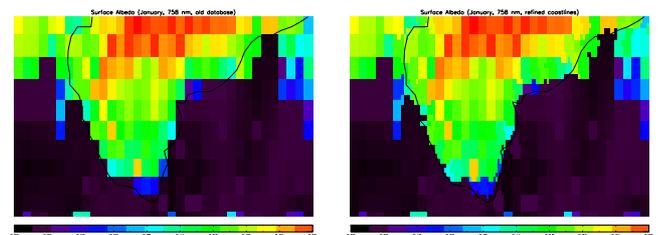
## 3. LER spectra for various surface types



## 4. Time series of LER values of the Lybian desert



## 5. LER database refinement at the coastlines from 1° to 0.25°-resolution



### References

Koelemeijer *et al.*, *J. Geophys. Res.*, 108(D2), 4070, doi:10.1029/2002JD002429, 2003  
 Fournier *et al.*, ESA/ESTEC Report 17332/03/NL/GS, 114 pp., 2004.